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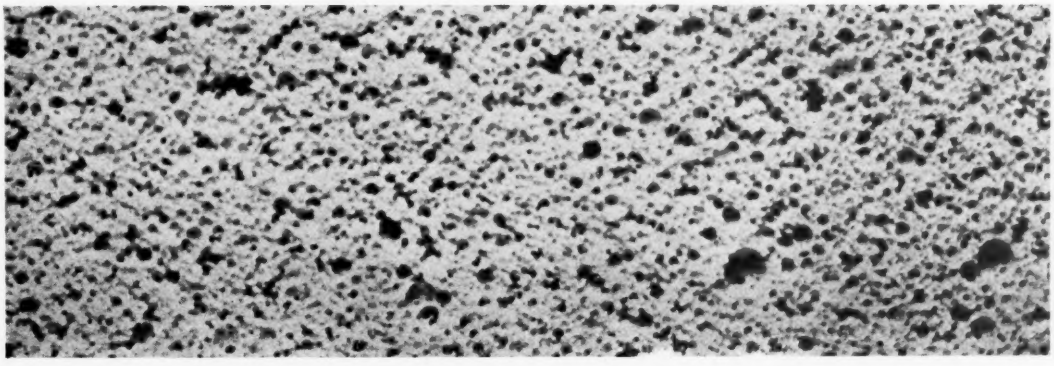
Foamed Latex Sponge

A New Technique in Rubber Manufacture

H. E. Elden[1]



"Dunlopillo" Foamed Latex Sponge (Magnified Approximately Ten Diameters)

UNTIL quite recently rubber manufacturers were engaged in devising ways and means of producing goods from solid dried rubber because that form of rubber was the only commodity available. The milk of the rubber tree was a material of purely scientific interest. Little was known of its properties and less of its advantages. It was looked upon as the source from which the main raw material of the rubber industry was derived. In contrast to coagulated rubber, latex in its natural condition deteriorated rapidly and was not easily transported.

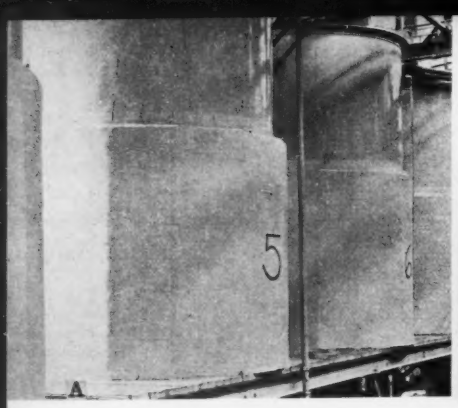
Procurement of Latex

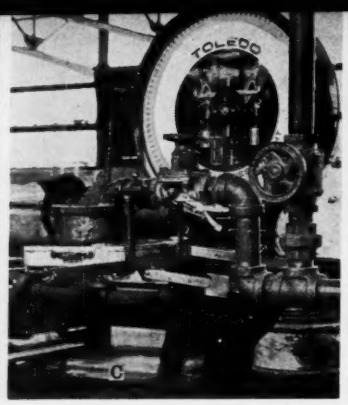
The natural superiority of latex for many purposes has only recently been discovered, and even now is not fully appreciated, as greater knowledge of its peculiarities and possible usage is being developed every day. The difficulties involved in the transportation of latex, and its preservation, have been overcome by modern transport facilities and latter-day rubber chemical science. Rubber latex is now a standard article of commerce, and rubber manufacturers have at their command a new material which is making possible a much wider use of rubber.

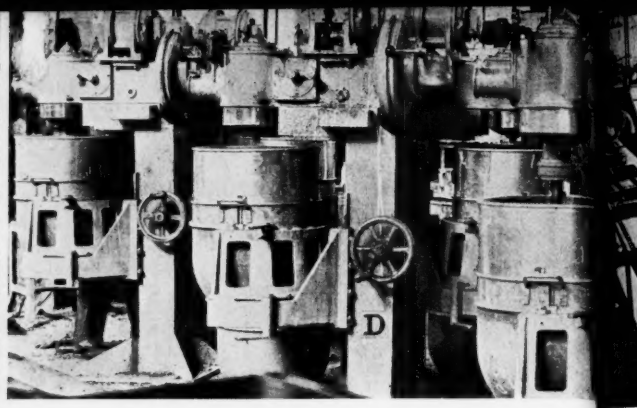
Like milk, *Hevea* latex owes its opacity to the presence of minute droplets or globules in suspension and tends to curdle: the resulting clot in the former being cream cheese; in the latter, rubber. Although the suspended globules of rubber do not cream to the surface so easily as milk-fat globules, the separation of the rubber latex into a "cream" rich in rubber, and a "skimmed latex" poor in rubber, is effected at the plantation by a suitably modified centrifugal machine of the milk-separator type. By this treatment concentrated latex is produced having a rubber content of 60%. A small quantity of ammonia (0.5%) is added as a preservative. Utilization of this substance for the production of foamed latex sponge rubber material is perhaps the most outstanding development in the latex field. This material has been referred to as "Dunlopillo."

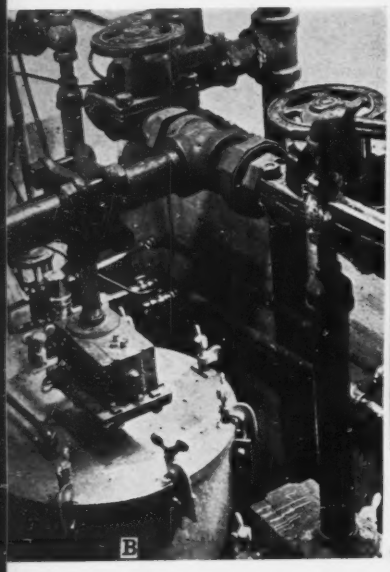
The latex is shipped by steamer from the Dunlop plantations at Singapore to the Dunlop depot located at

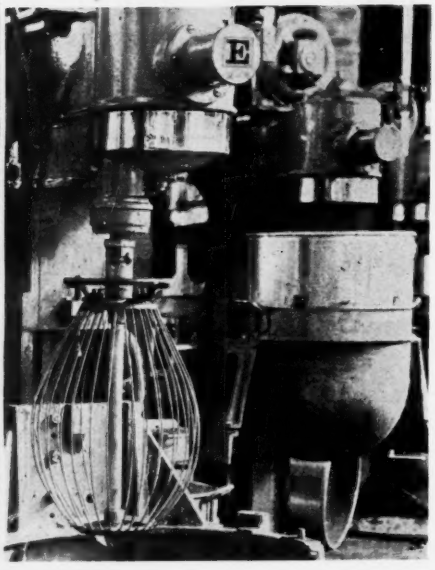
[1]Technical manager, Dunlop Tire & Rubber Corp., Buffalo, N. Y.











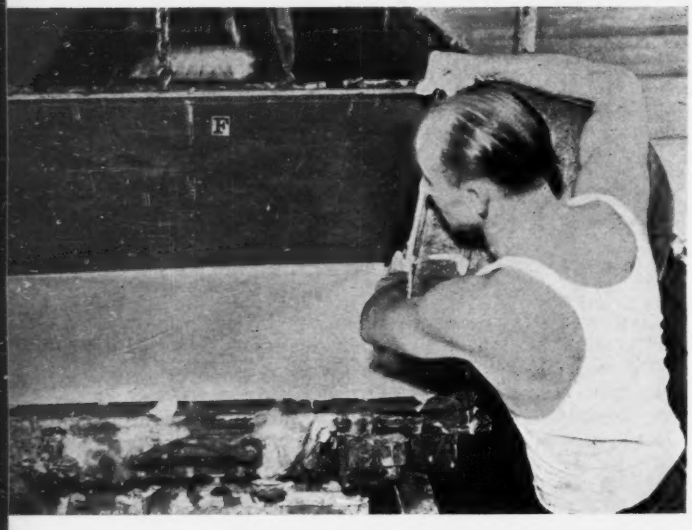


Fig. A. Mixing Tanks
Fig. B. Pressure Tank
Fig. C. Outlet Valve and Scales
Fig. D. Latex Whipping Machines
Fig. E. Frothing Whip and Head
Fig. F. Pouring Froth into Mold

Army Base pier, Boston. Each steamer's fore-peak and deep tanks having a capacity up to 60,000 gallons are utilized as containers for this purpose. At Boston the latex is discharged from the ship by specially constructed pumps at the rate of 400 gallons per minute into eight elevated storage tanks with a capacity of 20,000 gallons each. The temperature of the latex is maintained at from 70 to 80° F. Further to maintain this temperature in cold weather shipments special tank cars equipped with six inches of cork insulation are electrically preheated so as to bring the temperature of the car up to that of the latex. Centrifuged latex, although containing a high concentration of rubber, is quite mobile and after suitable treatment lends itself to casting into complicated shapes.

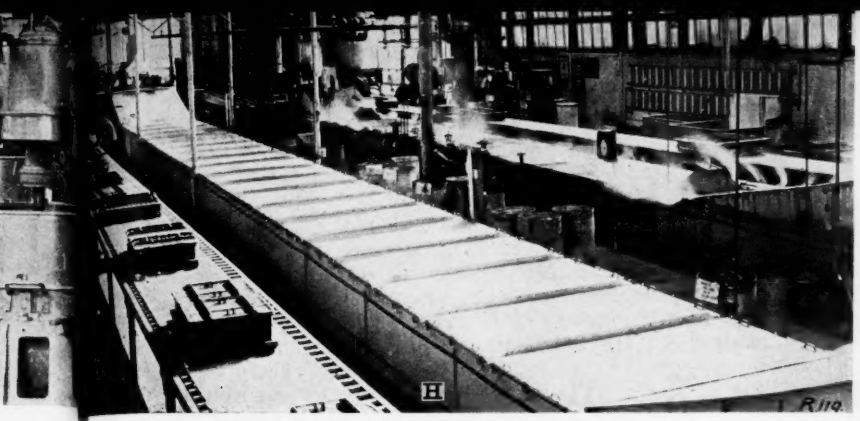
Frothing, Curing, and Washing

It is of interest to note that unlike regular rubber compounding practices the ingredients added to the latex are colloidal emulsions and dispersions. The mix consists mostly of concentrated latex; the other components are those necessary to bring about appropriate froth stability, viscosity, and vulcanization. This liquid mix has to be kept under constant agitation at different degrees of exact temperature control during part of which time maturity of the mix takes place before it is ready for use.

In the manufacturing process centrifuged latex to which vulcanizing agents have been added in appropriate mixing tanks (Figure A) is forced by means of a pressure tank (Figure B) to an outlet valve (Figure C) where the mixed latex is weighed into a frothing bowl. The bowl is then placed on a frothing machine equipped with a whip (Figures D and E). To an accurately predetermined quantity of this latex mixture is added a small amount (approximately 1% on the dry rubber content) of a froth producing agent (castor oil soap), and the whole is then beaten into a froth. The ratio of the volume of air to latex compound is controlled in accordance with the required density of the individual product. During the frothing period a quantity of gelling agent is added which, after a time interval of approximately 10 minutes, will cause the froth to set to a gel-like formation consisting of countless interconnected air cells which provide complete porosity. The quantity of this delayed coagulant, a dispersion of sodium silicofluoride, varies with the room temperature, but usually approximates 1% dry weight.

This froth is poured into the mold directly after the frothing operation (Figure F), and the mold lid is placed in its proper position so that the gellation of the froth will occur in the mold, thereby forming the final shape of the product. Since the froth is fluid when poured, complicated and deep molds of any structure or design may be easily filled.

After the froth has thoroughly gelled, the molds are conveyed through a tank (110 feet long) of water maintained at 205° F. (Figures G and H). The time of immersion is 50 minutes, during which the product is vulcanized. Depending on the choice of the vulcanizing agents used, the product may be cured in water, steam, or hot air within a time interval of from 30 minutes to several hours. The curing temperature may also vary from moderate



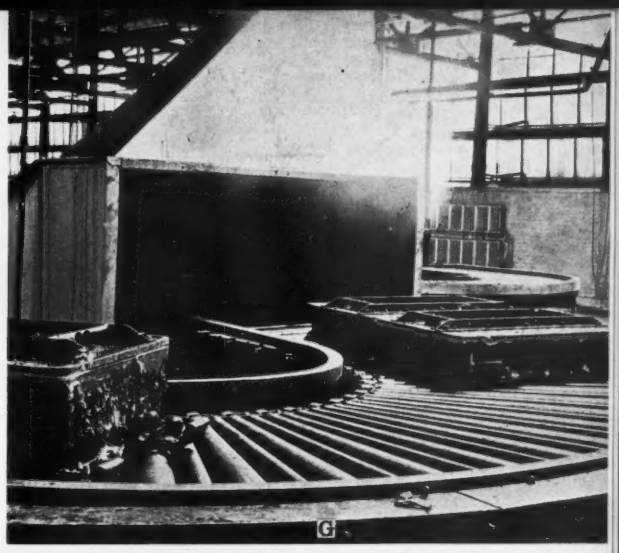
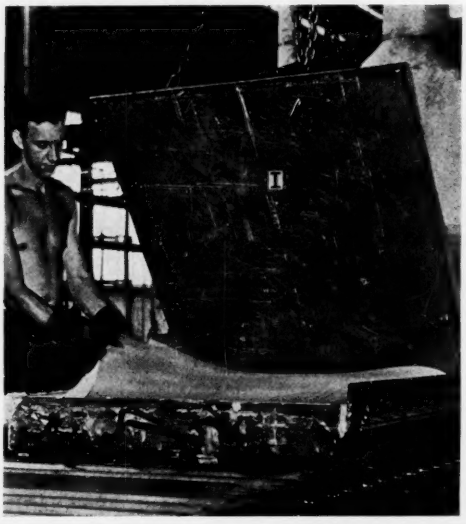
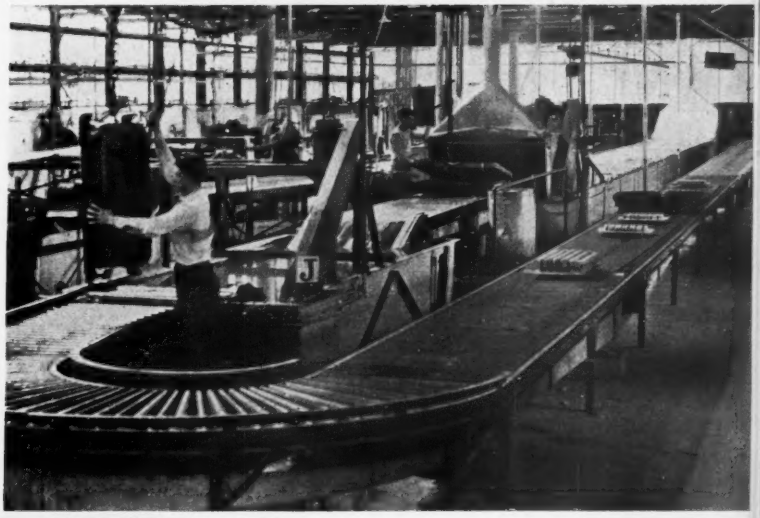
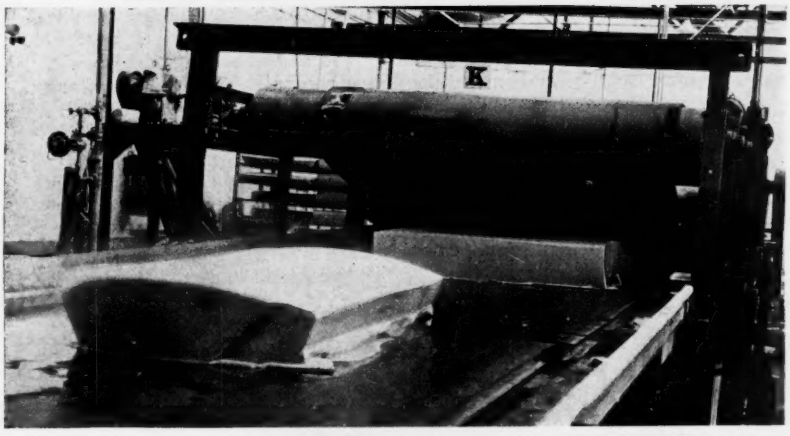


Fig. G. Mold Entering Curing Tank
Fig. H. Two Curing Tank Units
Fig. I. Removing Product from Mold







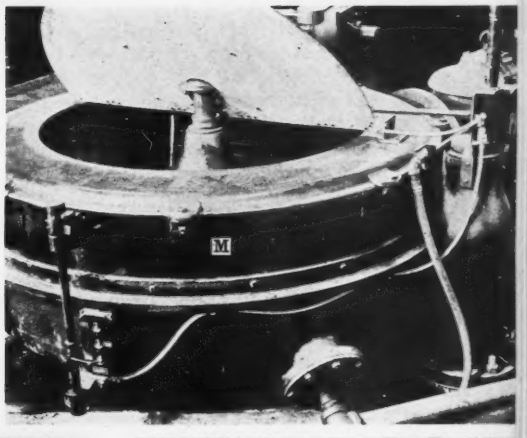


Fig. J. Curing Unit with Mold Drying at Left
Fig. K. Cushion Entering Squeezing Conveyers
Fig. L. Cushions Leaving Squeezer
Fig. M. Centrifuge Drier
Fig. N. Compression Test Machine

(150° F.) to a relatively high degree (300° F.).

The mold is now opened (Figure I) and the product removed. Both the lid and the mold are cooled and blown dry (Figure J) in preparation for refilling. While this operation is going on, the product is put through a belt squeezer for removal of the serum retained during vulcanization, washed in fresh running water for removal of odors, and then again squeezed (Figures K and L). After a second thorough wash and removal of the bulk of this water in a centrifuge (Figure M), the products are placed on racks and finally dried in a current of warm air.

When thoroughly dry, each piece is trimmed, inspected, and tested for exactness as to size and final dry weight, and the degree of softness is determined by a deflection and compression machine (Figure N); after which the product is ready for the customer.

The manufacturing process lends itself to mass production because each phase can be readily mechanized. The plant investment required is, like that for other latex products, relatively low. Since no pressure is required during curing, the molds can be simple sheet metal bowls or pans hung in suitable standard frames for protection. The lid with its cylindrical cavity-forming lugs may be assembled from standardized stock parts. Close manufacturing tolerances are not necessary as the finished product is resilient.

Characteristics of Foamed Latex Sponge

The requirements of a good cushioning material are complex in that the product must be capable of wide application, easy to install, durable, and satisfactory to the consumer. With the exception of mattresses and a few utility cushions, standardization of shapes and sizes is impossible as most cushions are made to customers' specifications. The product should remain cool and dry, be capable of ventilation, and insure comfort by supplying a firm, but conforming support to the load.

Some of the outstanding properties of foamed latex sponge rubber are: adaptability to the predominating irregular-shaped cushions through molding; ease of trimming and upholstering as a single unit; retention of rubber's natural nerve through the absence of mastication; low-temperature vulcanization by ultra-accelerators; uniformity of interconnected cells with high skin porosity; freedom from objectionable odors; and resistance to laundering with soap and water or a mild disinfectant. A borax rinse is recommended after renovation by washing. Because of the possible selection of compounding ingredients and thorough washing after curing, objectionable odors are eliminated. As a result of the process of manufacture, the thin outer skin consists of a series of flattened interconnected bubbles which together with the internal interconnected cells permit continual pumping of air through the entire mass with every movement. This may be demonstrated by blowing smoke into one of the lower cavities when it will be seen to penetrate the material and escape through the upper surface.

Advantages over Other Materials

In comparison with many other cushioning materials latex sponge rubber is especially suited to the purpose as regards: absorption of vibration and shock; weight of required material; reduction of space consumed to give equal or greater cushioning effect; absence of noise; lack of attention required; comfort through firm conformation to irregular contours, thereby rendering soft uniform support; appearance because of its ability to assume continually its original shape after deformation; and hygienic properties as it does not promote the activities of vermin or growth of bacteria.

Freedom from maintenance and repair expense is another feature. Each unit is homogeneous; there are no component parts to become loose or detached. Here is complete elimination of the customary difficulty with other conventional forms of cushioning where the top padding is easily displaced and metal springs become untied so that the springs form uneven surfaces or puncture the upholstering fabric. "Dunlopillo" cushions are mounted on a rigid base, properly vented, and the cover of upholstering fabric is applied directly on the rubber. The operation is simple, and there is nothing to become loose or uneven. The size of the vent holes in the base, which are located to correspond with the molded cavities in the underside of the cushion, is governed by the use to which the cushion is to be subjected and the degree of damping required. The damping properties of the seat are relative to the flow of air through these cavities.

As deep coil springs may be eliminated, a thinner cushion will produce equal or greater comfort, thereby saving space. In one experimental case where this rubber was used as a back rest, it was discovered that a popular priced five-passenger sedan body could be converted to a seven-passenger sedan. In the future the seats in transportation vehicles and the home may be simplified, beyond even the dreams of optimistic designers, by the use of this new cushioning material.

Application

The widest commercial application of "Dunlopillo" cushioning has been as an upholstery material replacing springs, cotton, hair, moss, webbing, and other conventional fillers. Of those consuming fields which have adopted this cushioning medium, the transportation industry was one of the first. To both city service and long-distance bus operators the added comfort and decreased maintenance cost were found to be a valuable asset. The railroads recognized in this material the luxurious restfulness which competition had forced them to seek. Hospitals, hotels, and institutions have recognized its novel sanitary properties as well as its cushioning advantages. It is particularly suitable for ambulance and hospital mattresses and for operating table pads.

Manufacturers of high-grade mattresses and luxurious furniture for the home, offices, and public buildings are utilizing latex foam rubber to a rapidly increasing extent. For trucks and tractors the simplicity and durability of these cushions are readily acceptable. Latex sponge is standard equipment in several of the 1939 automobiles, and there are indications that others will adopt it for the 1940 models. Since cushions of this material of a given design are practically identical, the upholstering of an automobile may be more highly mechanized, thereby reducing the high labor cost of the conventional trim shop.

Also latex sponge has found numerous diverse applications such as, airplane crash pads, football equipment, pads under bone fracture casts, inner soles for shoes, and sponges for a new squeegee-type mop.

This process developed and perfected over the past eight years by the Dunlop Tire & Rubber Corp., Buffalo, N. Y., is protected by U. S. patent Nos. 1,777,945, 1,828,481, 1,852,447, and others which the company controls.

"Dunlopillo" cushioning, the trade name adopted by Dunlop, is manufactured in England, Australia, France, and Canada as well as in the United States. Several of the major rubber companies in this country have been licensed by Dunlop; hence such trade names as "Airfoam" and "U.S. Royal Latex Foam" now describe foamed latex sponge rubber made by the Dunlop process.

Uniting Rubber to Metal

Joseph Rossman

THE following patent résumés continue the informative article on uniting rubber to metal, begun in our January issue. These recent patents have been classified according to the method used: by adhesives, by plating, and by other methods. Those abstracts immediately below conclude the adhesives group.

18. Fisher, 1,926,867, September 12, 1933. A method of uniting metal to rubber comprises applying to a ferrous metal a composition consisting of a mixture of products resulting from further vulcanizing solutions of soft vulcanized rubber in the presence of additional sulphur to substantially different degrees of combined sulphur, the higher degree product having at least approximately 15% of combined sulphur, an organic softener for rubber, and an organic accelerator, drying the composition, applying a body of rubber, and vulcanizing.

Both the solution of hard rubber and the solution of rubber vulcanized to a less degree of combined sulphur may be prepared in a manner similar to that described in the patent to Gibbons et al., No. 1,745,533, issued February 4, 1930. In the first example, in this patent it is stated that soft vulcanized rubber may be dissolved by heat in a suitable solvent, as solvent naphtha, sufficient sulphur added to produce hard rubber, and the solution then heated until the rubber contains more than 15% of combined sulphur and substantially no free sulphur, and in this specific example it is stated that the reaction will require 2½ hours at a temperature of 163° C.

19. Thompson, 1,931,309, October 17, 1933. To adhere rubber to metal coat the latter with a solution of a vulcanizable rubber composition and a fusible phenol-aldehyde condensation product in a solvent comprising a moderately volatile ester, evaporate the solvent, apply a layer of vulcanizable rubber, and vulcanize the assembly under heat and pressure.

20. Twiss, 1,931,879, October 24, 1933. A composition for bonding rubber to metal comprises the reaction product of a resin of the group consisting of balata resin, gutta percha resin, and rubber resins with a relatively small quantity of a reactive polymerized or polymerizable unsaturated hydrocarbon in the presence of an agent of the group comprising sulphuric acid, sulphonic acids, mixtures of these acids, stannic chloride, and phosphoric acid.

Example. Seventy parts by weight of the semi-fluid resin obtained by extracting crude balata with a light petroleum solvent are admixed with 30 parts by weight of masticated smoked sheet rubber and maintained at 100° C. until a solution results. The solution of rubber in the balata resin is then mixed with 10 to 20% of phenol sulphonic acid, and after being stirred well at 100° C., is heated to 120 to 130° C. in an air oven. After about 30 minutes a vigorous reaction takes place accompanied by frothing. The mixture is then removed from the oven and stirred well. When the frothing begins to subside, the mass is quickly cooled in cold water, and the roughly crushed material washed to remove excess acid. The dried product is dissolved in a suitable organic solvent such as toluene or carbon tetrachloride and applied in this form as an adhesive for rubber to metal.

21. Dunfield, 1,943,423, January 16, 1934. An adhesive for uniting rubber to metal comprises previously dissolved rubber, about 10 to 20 parts of undissolved rubber to 100 parts of previously dissolved rubber, vulcanizing ingredients, and a solvent.

22. Courtney, 1,946,932, February 13, 1934. A process of preparing a laminated article of metal and rubber comprises applying a cement obtained in the treatment of rubber with sulphuric acid to a base material, superimposing thereon a composition containing a resinoid in reactive condition, and applying heat and pressure to the resulting product to set the resinoid and simultaneously bond the resinoid composition to the base material.

23. Beal, 1,994,165, March 12, 1935. The method of coating metal articles with an adherent layer of rubber comprises electrodepositing on the articles a thin layer from an aqueous dispersion comprising a tough, heat-plastic rubber isomer, thereafter electrodepositing thereon a layer of rubber from a vulcanizable aqueous dispersion of rubber, and drying and vulcanizing the deposit.

24. Lee, 2,031,720, February 25, 1936. The method of securing together a piece of metal and a body including rubber consists in applying on the surface of the metal successive layers of a composition containing the ingredients of hard rubber in an unvulcanized state and including a free vulcanizing agent, heat curing each layer before the next is applied until a substantial part materially less than all of the vulcanizing agent is combined chemically with the rubber of the composition, molding a body including vulcanizable rubber on the coated metal, and heating the resulting unit to cure the rubber of the body and to vulcanize the layer to a hard rubber state and to cause it to become integrally bonded with the metal surface and with the rubber of the body.

25. Griffith, 2,058,865, October 27, 1936. A strongly bonded composite product of rubber and metal with an intermediate adhesive comprises a layer of thermoplastic rubber immediately adjoining the metal and a vulcanizable rubber cement on said thermoplastic rubber layer including only 3% of sulphur and from 40 to 45% of carbon black used as a strengthening filler, such percentage based on the rubber content.

26. Merrill, 2,078,910, April 27, 1937. To bond cured rubber to a base treat a surface of the rubber with a solution of bromine in ethylene dichloride and then bond this surface to the metal by a thermo-setting resin.

27. Merrill, 2,078,911, April 27, 1937. To bond cured rubber to metal resinify a surface of the rubber with tin tetrachloride and then bond this surface to the metal by a thermo-setting resin.

28. Freedlander, 2,088,470, July 27, 1937. A printing roller comprises an axle of metal, a coating thereon to which rubber adheres, a soft rubber roller body vulcanized to the coating, a relatively thin coating of non-rubber material adapted to protect the rubber within while at the same time present a hard impervious surface unaffected by printing inks, the coating being capable of vulcanization to the soft rubber within, and a cement coating comprising a solvent as benzol and isoprene.

29. Charch, 2,128,635, August 30, 1938. In a method for improving the adhesion between materials comprising

a base and rubber, the steps follow: treating one of the materials with an aqueous solution containing dispersed rubber, containing a mixture of a polyhydric phenol and an aldehyde, or a polyhydric phenol and an aldehyde in partially condensed form, and a catalyst, applying the material so treated to the other material, and vulcanizing the rubber.

30. Harkins, 2,130,008, September 13, 1938. A composite rubber-to-metal assembly has a surface of the metal portion integrally bonded to a vulcanized flexible semi-hard rubber coating containing an amount of carbon black in excess of 100 parts by weight per 100 parts by weight of rubber and a relatively large amount of a flexibility imparting agent inert to chlorine and from 15 to 25% by weight based on the rubber content of chemically combined sulphur.

Example. The parts are by weight. A composition consisting of smoked sheet 100 parts, thermatomic carbon 150 parts, asphalt (high softening point) 50 parts, diphenylguanidine two parts, lime (hydrated) 10 parts, sulphur 20 parts, dinaphthylamine (antioxidant) one part, may be calendered and applied to a metallic surface after treating the surface with a rubber-to-metal adhesive, and vulcanized for two hours in steam at a pressure of 45 pounds per square inch, or in the case of a tank it may be filled with hot water heated sufficiently to vulcanize the coating.

31. Schelhammer, 2,130,905, September 20, 1938. The method of coating sheet metal with corrosion-resisting hard rubber consists in attaching a layer of hard rubber compound to the metal, applying a veneer of pure rubber of not more than 15/1,000-inch on the hard rubber compound, subjecting the whole to a dry cure in gas at 290° F., under pressure, to glaze and vulcanize partially the veneer of rubber, and then subjecting the whole to vulcanization by steam.

By Plating

1. Thompson, 1,906,436, May 2, 1933. The method of adhering rubber to iron or steel comprises treating the metal with a solution of copper chloride in a substantially anhydrous volatile alcohol until the metal is coated with a copper film, removing the metallic salts from the metal surface, permitting evaporation of the solvent, and vulcanizing rubber in contact with the treated surface under heat and pressure.

2. Domm, 2,002,261, May 21, 1935. A ferrous base article adapted for adherent vulcanization to rubber comprises a ferrous base, a layer of zinc thereon, the total thickness of zinc on the base being between 1/4,000- to 1/11,000-inch, and a copper layer adapted to alloy with the outer surface of the zinc and 1/60,000- to 1/240,000-inch thick, whereby copper and zinc form a thin layer of rubber adherent brass at atmospheric temperature or the temperature of vulcanization.

3. Domm, 2,002,262, May 21, 1935. Rubber-coated ferrous-base articles are made by producing a cadmium brass coating by separately coating the article with a thin coating of cadmium, and a layer of copper having a thickness less than approximately 1/66,000-inch and of a thickness to alloy throughout with the cadmium at atmospheric temperature or at the temperature of vulcanization and produce a thin layer of cadmium brass thereon, and vulcanizing a coating of rubber thereon.

4. Domm, 2,002,263, May 21, 1935. A rubber-coated article comprises a ferrous metal base, a coating of corrosion resistant metal such as zinc, cadmium, tin, and lead over the base, a thin copper coating thereon less than approximately 1/60,000-inch thick and thick enough to alloy throughout with the corrosion resisting metal at atmospheric temperature or the temperature of vulcanization and produce a thin coating of rubber adherent alloy thereon, and a coating of rubber vulcanized thereon.

5. Domm, 2,038,548, April 28, 1936. A coated tire bead wire comprises a ferrous base wire having a hot-dipped coating of cadmium thereon, an electrodeposited coating of zinc thereon, and a coating of rubber vulcanized thereto.

6. Domm, 2,038,549, April 28, 1936. A coated tire bead wire comprises a ferrous base wire having a hot-dipped coating of cadmium thereon, an electrodeposited coating of cadmium thereon, and a coating of rubber vulcanized thereto.

7. Domm, 2,038,550, April 28, 1936. A coated tire bead wire comprises a ferrous base wire having a hot-dipped coating of a zinc-cadmium alloy thereon, an electrodeposited coating of cadmium thereon, and a coating of rubber vulcanized thereto.

8. Domm, 2,038,551, April 28, 1936. A coated tire bead wire comprises a ferrous base wire having a hot-dipped coating of a zinc-cadmium alloy thereon, an electrodeposited coating of zinc thereon, and a coating of rubber vulcanized thereto.

9. Domm, 2,039,068, April 28, 1936. The method of attaching a ferrous base metal object having a coating of a metal such as zinc, cadmium, tin, and lead thereon to rubber, comprises applying to such coating a thin layer of metal of arsenic or antimony, the layer being thin enough to alloy throughout with the underlying metal and produce a thin layer of alloy thereon.

10. Domm, 2,039,069, April 28, 1936. A ferrous tire bead reenforcing wire has thereon a galvanized coating of zinc covered by a layer of copper less than 1/60,000-inch thick and thick enough to alloy throughout with the zinc at atmospheric temperature or at the temperature of vulcanization and produce a thin layer of brass thereon, and a thin surface coating consisting originally of a metal such as arsenic and antimony.

11. Malone, 2,078,917, April 27, 1937. To attach rubber to metal dip-coat a bronze containing up to 15% tin in the outer layers upon the metal from a solution containing copper and tin, bring rubber containing a vulcanizing agent into engagement with the coated surface, and vulcanize the rubber on to the surface.

12. Domm, 2,120,737, June 14, 1938. A ferrous base tire bead reenforcing wire has a galvanized zinc coating thereon, a flash layer of relatively high melt-point metal on the zinc, and a hot-dipped zinc coating upon the intermediate layer.

13. Domm, 2,120,738, June 14, 1938. A tire bead reenforcing wire comprises a ferrous base wire, a hot-dipped zinc coating thereon, a flash coating of nickel on the zinc, a hot-dipped coating of cadmium on the nickel, and a thin layer of antimony on the cadmium; the antimony is thin enough to alloy throughout with the cadmium at atmospheric temperature or the temperature of vulcanization.

14. Elder, 2,135,886, November 8, 1938. Steel wire is coated with a copper-tin alloy, containing not over 20% copper, to which is vulcanized a rubber compound.

(To be concluded)

THE AMERICAN SOCIETY OF SAFETY ENGINEERS estimated 78% of all accidents were due to the failure of the human element and only 22% to physical and mechanical faults. How to correct machine hazards is usually obvious. To reduce the 78% has been more difficult. First-aid training, along with other sound methods of safety education, should go a long way to control accidents due to human failures. *N. S. C. News Letter.*

Some Properties of Two Vulcanized Pure Gum Compounds at Low Temperatures[1]

A. A. Somerville[2]

SOME excellent work has been published by various authors on the effect of low temperatures on the properties of rubber, but the field is still relatively new so that it seems worth while to continue to study along the lines of modern compounding.

Accordingly this laboratory laid out an elaborate compounding and testing program in an attempt to cover the effect at low temperatures on vulcanized rubber of the various classes of compounding ingredients, such as accelerators, antioxidants, fillers, softeners, raw rubbers, and reclaimed rubber. The data given in this paper cover only a very small proportion of the total work contemplated and are confined to the properties of two pure gum compounds. They do not include any specific recommendations for the compounding of rubber to resist the action of very low temperatures.

Ten years ago at the Swampscott, Mass., meeting of the American Chemical Society we showed that over-vulcanized rubber breaks off short when stretched at 100° C. The compounds used at that time were vulcanized with what has come to be known as a normal proportion of sulphur, and no recommendations were made as to how the shortness or brittleness might be prevented. Later, in various issues of the *Vanderbilt News*, it was shown that by the use of what has come to be known as "low sulphur" plus suitable acceleration, the over-vulcanized condition above referred to could be prevented, and likewise the resulting shortness or brittleness at 100° C. In most of that past work physical properties at three temperatures were shown: viz., at 100°, 25°, and 0° C. In the present work physical properties are shown also at — 30°, — 40°, — 50°, and — 60° C.

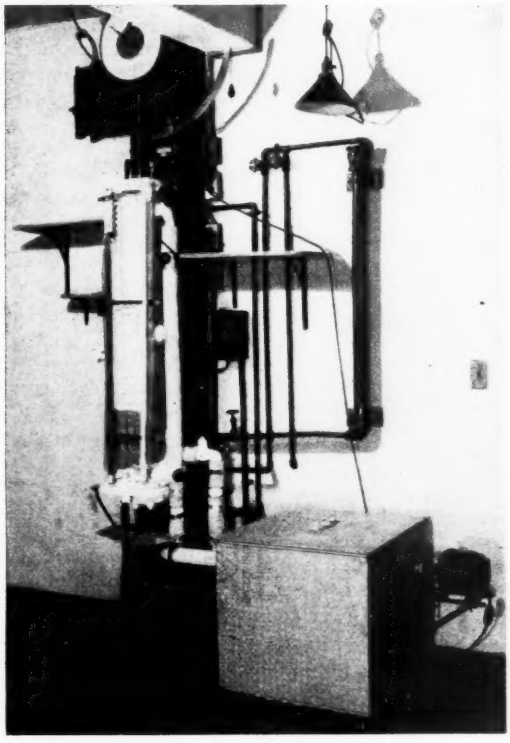


Fig. 1. Scott Tester with Tank and Cooling Equipment

Terrestrial Cold Spots

Some idea of the low temperatures to which rubber goods may be exposed in service can be gained from Table 1, which lists a number of low temperatures recorded at various places in northern latitudes. These data were obtained through the United States Weather Bureau.

TABLE 1

United States	°C.	Canada	°C.	Europe and Asia	°C.
Denver, Col.	— 34	Medicine Hat	— 33	Sweden (Interior)	— 45
Omaha, Neb.	— 35	Banff	— 34	Finland (Interior)	— 45
Dubuque, Iowa	— 35	Edmonton	— 36	N.E. Russia	— 50
Concord, N. H.	— 37	Winnipeg	— 38	Lugan, U.S.S.R.	— 41
Klukwan, Alaska	— 38	Norway House	— 46	Orenburg, U.S.S.R.	— 41
Anchorage, Alaska	— 38	Fort Vermillion	— 48	Pamirski Post, U.S.S.R.	— 47
Pierre, S. D.	— 40	Prince Albert	— 57	Archangel, U.S.S.R.	— 47
St. Paul, Minn.	— 41			Bogoslovsk, U.S.S.R.	— 49
Helena, Mont.	— 41			Ishim, U.S.S.R.	— 54
Kenai, Alaska	— 43			Barnaul, U.S.S.R.	— 55
Bismarck, N. D.	— 43			Yeniseisk, U.S.S.R.	— 59
Fairbanks, Alaska	— 54				
Fort Yukon, Alaska	— 57				
Tanana, Alaska	— 60				

Apparatus for Physical Testing at Low Temperatures

In making physical tests at very low temperatures it was found convenient to break the specimens in acetone kept cold by means of dry ice. Figure 1 shows a photograph of the special Scott tester equipped with testing tank and external cooling apparatus used to reach temperatures down to and including — 60° C. The cooling system consisted of a cork-lined tank about 20 inches cube with close-fitting lid. Within the tank 200 feet of ⅜-inch copper tubing were coiled, and this coil was connected through a centrifugal pump to the testing tank in which the specimens were stretched. The testing tank and coil were filled

[1]Presented at the Rubber Technology Conference, London, England, May 23-24, 1938. Reprinted from the "Proceedings of the Rubber Technology Conference."

[2]Vice president, R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.

with circulating acetone which was kept cold by means of dry ice surrounding the coil.

Measurement of Hardness at Low Temperatures

To obtain hardness measurements the samples were laid on a metal plate supported by means of wooden strips directly over a quantity of dry ice contained in a rectangular box. The temperature directly over the metal surface was maintained at the desired level by means of a current of air blown in through the bottom of the box. Hardness readings were taken by quickly raising the lid and placing the Shore instrument on the samples without their removal.

Preparation of Test Pieces

All test pieces used were dumb-bell test pieces, ⅛-inch wide and one inch long at the constricted portion, cut from slabs 0.075-inch thick. All slabs were vulcanized in a press at 40 pounds' steam pressure (142° C.) The hardness measurements were made on slabs of the same thickness.

TABLE 2. PURE GUM FORMULAS

	A	B
Smoked sheet	100	100
Stearic acid	1	1
"Agerite Resin D"	—	2
Zinc oxide	10	10
Sulphur	10	2.5
Mercaptobenzthiazole	0.2	1.5

Compound A contains very high sulphur plus a small amount of accelerator to enable it to be vulcanized alongside compound B which contains a normal amount of sulphur and accelerator. This range of sulphur was chosen to show the possible effect of abnormally high combined sulphur.

Figure 2 shows the tensile-time of vulcanization curves of compound A at five temperatures. As was to be expected, this compound is slow vulcanizing, and the tensile strength drops off rapidly beyond the optimum. The curves at four of the five temperatures are similar in shape, but at 100° C. the falling off in tensile strength beyond the optimum is extremely rapid, as is customary with over-vulcanized pure gum stocks tested at this temperature. Note that the strength at — 60° C. is nearly double the strength determined at room temperature.

The percentage combined sulphur[3] on the rubber content of the compound is also plotted against time of vulcanization, and at the final period of 300 minutes over 80% of the original sulphur is combined. Note that regardless of the increasing combined sulphur the spread between the 25° and the — 60° curves is practically the same at all vulcanizations.

Figure 3 shows the tensile-time of vulcanization curves for compound B at the same five temperatures. This compound naturally vulcanizes faster than compound A, and the falling off in tensile strength beyond the optimum is much less, even at 100° C. Note that the strengths at all temperatures are higher than with compound A and that the increase in strength at — 60° C., over room temperature, is about the same as with compound A.

The combined sulphur reaches a maximum at the 20-minute vulcanization, and again no correlation exists between combined sulphur and the spread between the various curves.

Figure 4 shows the modulus-time curves for compound A. Note the extreme spread between the —40° and —60° C. curves. Inasmuch as this modulus was taken at 500% and inasmuch as many of the samples broke at an elongation less than this, all of the curves end before the full period of vulcanization of 300 minutes.

Figure 5 shows the modulus-time curves for compound B. Again note the enormous spread between the — 40° and — 60° C. curves. Here the modulus is shown for the full range of vulcanization periods because the compound has at all times an elongation at break greater than 500%.

Figures 6 and 7 respectively show the elongation-time curves of compounds A and B. The outstanding feature of compound A is the extremely sharp decline of the 100° C. curve. In contrast with A, the elongation curves of compound B are characterized by their flatness.

The T-50 value of a rubber compound, as defined by the originators of the test,[4] is the temperature in degrees Centigrade at which a sample of rubber, stretched by a predetermined amount and frozen, will, when released, retract to 50% of its stretched frozen elongation. The T-50 test is a method for determining the state of vulcanization of a compound.

In the case of compound A (Figure 8) the T-50 values beyond the 90-minute vulcanization were unobtainable because the test strips broke before reaching the elongation of 500% required for a true T-50 value. The T-50 values for compound B (Figure 9) continue to decrease after the optimum vulcanization, as judged from tensile strength values, has been passed, while the combined sulphur reaches a maximum at approximately the optimum.

Figures 10 and 11 show the Shore hardness versus time of vulcanization for compounds A and B respectively at different temperatures. At the optimum both compounds have approximately the same hardness. As would be expected, the hardness of A increases with vulcanization beyond the optimum, whereas that of B undergoes relatively little change. The outstanding feature of the two compounds is the extremely sharp rise of the — 30° C. curve of compound A. Here, therefore, is an indication that high combined sulphur is not the answer to the problem of resistance to low temperatures.

Figures 12 and 13 show the effect of time of exposure to cold on the hardness of compounds A and B. In this test only one period of vulcanization of each compound was investigated, namely, the optimum (60-min. for compound A and 20-min. for compound B). The slabs were placed in the cold box previously described, and their hardness was measured with a Shore durometer at intervals up to 4 hours.

Both compounds harden to the Shore value of 100 at — 60° C., which means that they are board-like and brittle. At — 50° C. they become practically as hard, though somewhat more slowly. No outstanding differences between the two compounds are apparent, regardless of the fact that there is about 1% difference in combined sulphur between the two samples. The board-like condition at — 60° C. is accompanied by such brittleness that the samples can be shattered to pieces with a light hammer blow. This fact in itself was rather to be expected, but it is certainly remarkable that this brittleness should be accompanied by an extensibility of over 500% for both compounds when tested at — 60° C. (Compare Figures 6 and 7.)

Figure 14 shows the results obtained after substituting deproteinized rubber for smoked sheet in compound B. Again only one period of vulcanization was used: namely, the optimum. The hardening at — 30° and — 40° C. was much less with this compound than with compound B, but at — 50° and — 60° C. there was no essential difference between the two rubbers.

Figure 15 represents raw smoked sheet, unmilled but pressed at about 105° C. for 30 minutes in a mold to give a sheet smooth enough for hardness measurements. This

[3]Combined sulphur was calculated by difference.
[4]W. F. Tuley, INDIA RUBBER WORLD, 97, 1, 39 (1937).

Fig. 2. Tensile Strength. Compound A

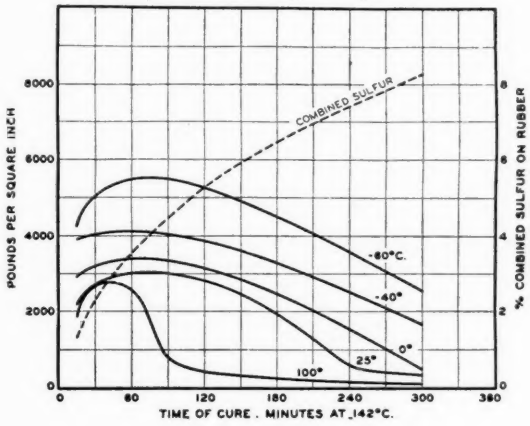


Fig. 3. Tensile Strength. Compound B

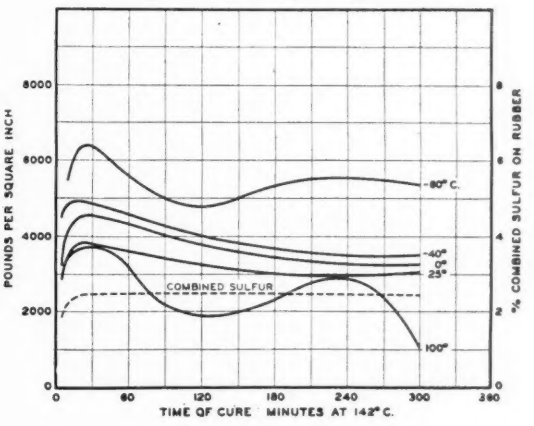


Fig. 4. Stress at 500%. Compound A

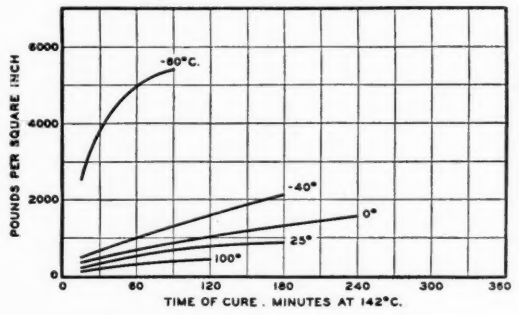


Fig. 5. Stress at 500%. Compound B

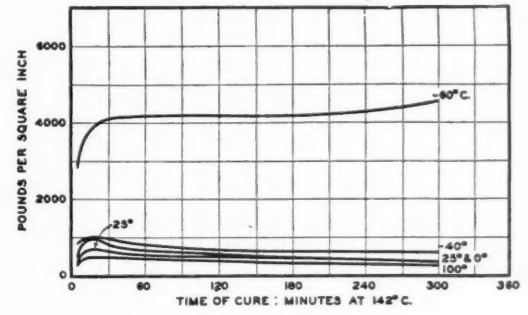


Fig. 6. Elongation at Break. Compound A

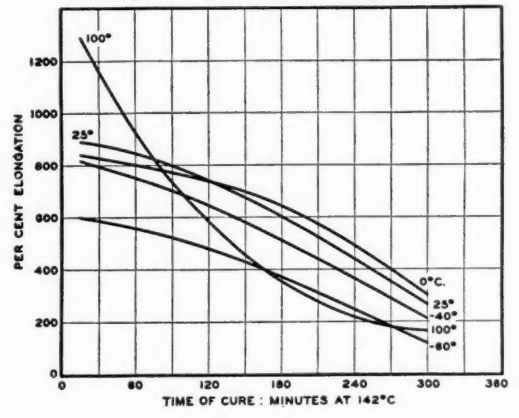


Fig. 7. Elongation at Break. Compound B

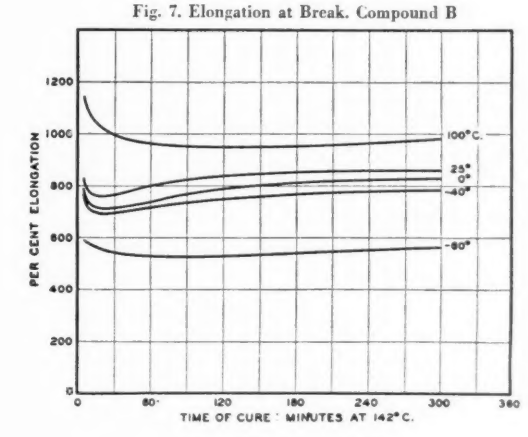


Fig. 8. T-50. Compound A

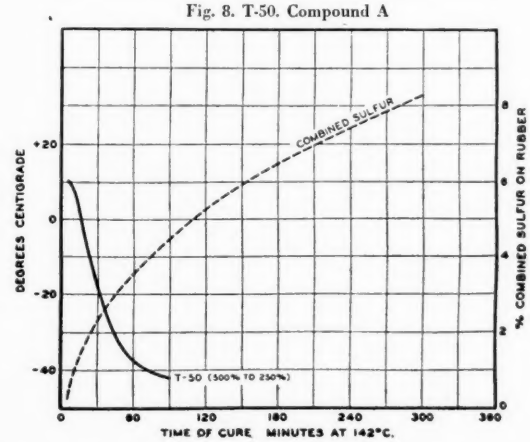


Fig. 9. T-50. Compound B

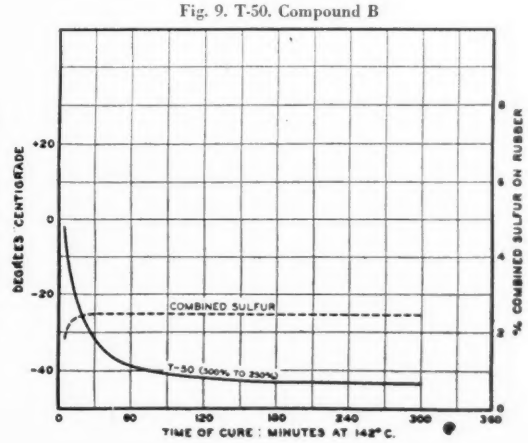


Fig. 10. Shore Hardness. Compound A

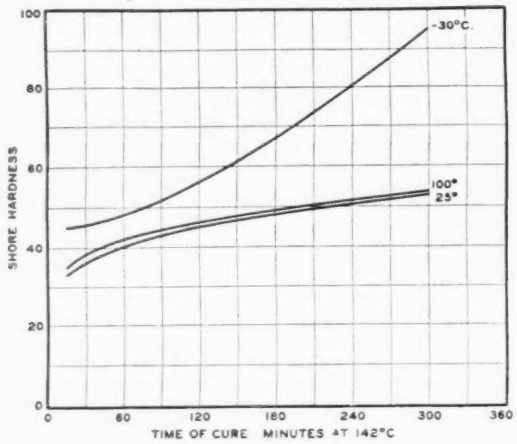


Fig. 11. Shore Hardness. Compound B

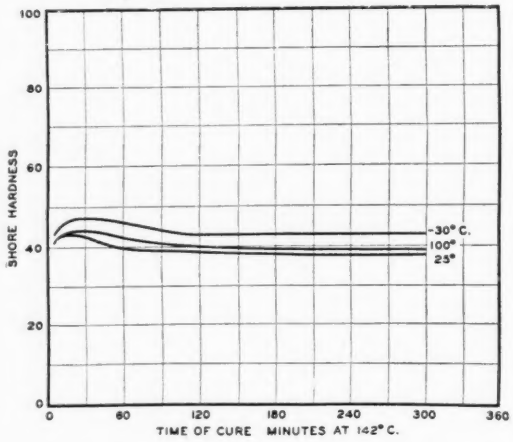


Fig. 12. Shore Hardness vs. Time of Cooling

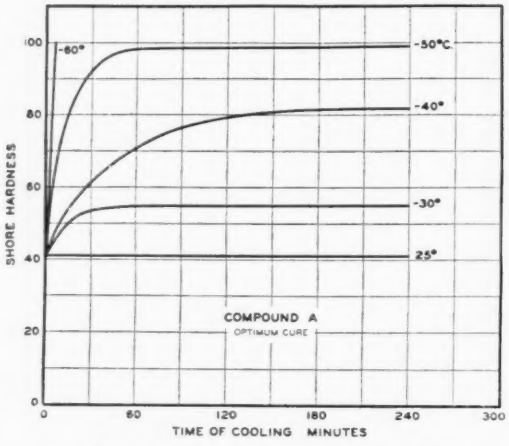


Fig. 13. Shore Hardness vs. Time of Cooling

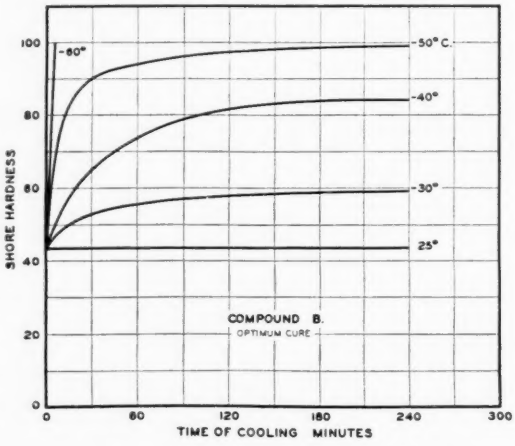


Fig. 14. Shore Hardness vs. Time of Cooling

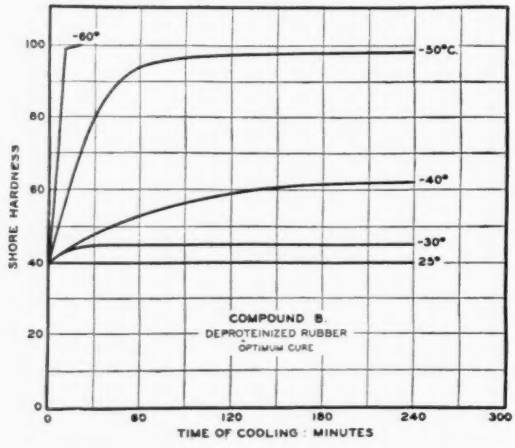
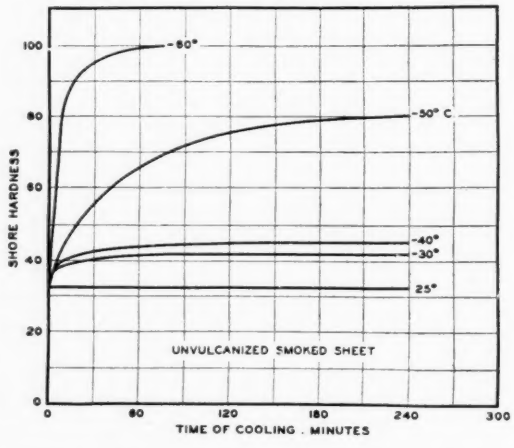


Fig. 15. Shore Hardness vs. Time of Cooling



raw smoked sheet is softer at room temperature than either of the two pure gum stocks, but the remarkable thing is its resistance to hardening when rapidly cooled to — 40° C. At — 50° C. it is still softer than the two pure gum compounds. At — 60° C. it does become board-like and brittle, but this change is much slower than with the vulcanized compounds.

This behavior of unvulcanized smoked sheet appears startling inasmuch as all rubber chemists know that vulcanization improves the resistance of rubber compounds to cold as well as heat. However the effect above described is not to be confused or compared with the ordinary phenomenon of frozen rubber, which is a condition brought about by long exposure to only moderately low temperatures. What is known as ordinary frozen rubber is an opaque leather-like material which does not return to its original, transparent, flexible condition until it has been warmed for some time at approximately room temperature. The changes which occur in rubber in the ordi-

(Continued on page 42)

Mealorub Rubber Powder[1]

MEALORUB, rubber powder containing about 96% rubber, is made by the Proefstation West-Java, Buitenzorg, Java, Netherland India. Production at present is being carried out in a small pilot plant on an experimental scale. When the demand justifies it, however, large-scale production will be put into effect.

Production Process

The production process, which was developed by J. W. Van Dalfsen, chemical engineer of Proefstation West-Java, consists primarily of acid flocculation of field latex to which a small quantity of sulphur and zinc oxide has then been added, after which the flocculate is removed from the serum by centrifuging. The product is then washed and dried.

In addition to the normal product a purified Mealorub is prepared with a low protein and ash content. The water absorption properties of vulcanized articles made from purified Mealorub are about the same as those from the best low-protein-content rubber available.

Characteristics

The larger part of the sulphur added during the process will be found as combined sulphur in the finished powder. The properties of Mealorub, however, indicate that the sulphur is not, for the greater part, combined with the rubber hydrocarbon as is the case with ordinary vulcanized rubber. The properties are somewhere between those of crude rubber and vulcanized rubber, which suggests that the sulphur is combined with non-rubber substances, for instance with the protein complex.

Mealorub contains about the same amount of serum substances as does crepe rubber; it is not, therefore, a whole-latex rubber as are most other rubber powders or rubber crumbs. An analysis report will accompany each export lot of Mealorub, giving the results as to: moisture content; sulphur content; zinc oxide content; nitrogen content; ash (minus zinc oxide); acetone extract; and water extract.

Like ordinary crude rubber the new powder consists of original latex particles, clotted together during the manufacturing process. However, the forces which hold the particles together are much less in the case of Mealorub in comparison with crude rubber. Each latex particle in Mealorub is coated with a thin non-adhesive layer, and owing to this structure disintegration of the powder is possible.

When Mealorub is wetted with a rubber solvent, a swelling takes place; the swollen powder, though, is not sticky as is solvent-treated crude rubber. The swelling tends to loosen the latex particles from each other so that together with mechanical disintegration dispersions of very small particle size can be obtained. By heating such a dispersion with more rubber solvent at about 150° C. or higher a colloidal solution is easily prepared. Both the dispersion and the solution are not sticky.

Dispersions of the powder in other than rubber solvents may be prepared by mechanical disintegration. But because of the lack of swelling this requires a large amount of energy. In making dispersions the addition of dispersing agents is often advisable.

Mealorub is easily sheeted on mill rolls, thus demonstrating its non-vulcanized state. The formed sheet is similar in appearance to crepe rubber, but is easily torn, owing to the low degree of cohesion. In contrast with ordinary crude rubber it is impossible to plasticize Mealorub without the addition of other substances. After prolonged milling some softening occurs, but the milled material cannot be calendered or formed in the usual way. By adding softeners the plasticizing effect increases, but not sufficiently for most purposes.

It is possible, however, to mix large quantities of Mealorub into plasticized crude rubber. Using 85 parts of the purified powder on 15 parts of crepe rubber, articles with a very low water absorption were obtained through the usual manufacturing processes. The milling time is shortened by adding sulphur and fillers along with the powder.

Application

With the exception, perhaps, of the preparation of articles with low water absorption from the purified powder, there is in view little or no economical use of Mealorub in the usual manufacturing of rubber articles. The applications which first suggest themselves lie in the field of new uses for rubber: molding powders, rubber derivatives, and asphaltic-bitumen mixes for roads.

Mealorub can be dispersed easily in molten bitumen when stirred and heated to 175° C.; after adding the rubber stirring must be continued for a few minutes. By adding small quantities of raw rubber (up to ten parts) to an oil-base asphaltic bitumen, the softening point is raised, and the flow is reduced. In many cases the hardness is raised also, and sometimes both the ductility and the adhesive properties are increased. These properties are similar to those of a blown-type bitumen, without, however, the increased brittleness. Thus the working range of the bitumen through the addition of rubber is extended to both higher and lower temperatures.

In road construction the addition of rubber to asphaltic binder improves the non-skid quality of the wearing surface. Actual road tests showed an increase of the coefficient of friction from 0.4 to 0.7 when 7½ parts of rubber were used to 100 parts of bitumen. The test was made seven months after construction on a wet surface. As the flow is reduced, the bitumen does not exude to the surface in hot weather, and, as the brittleness is not increased and is very often reduced, damage by frost is lessened. The reduced flow properties are also of interest in the coating of pipes and roofs.

Up to the present time rubber solutions have been the chief starting point in the manufacture of rubber derivatives. Owing to its powder structure, Mealorub appears suitable as a starting material for the production of derivatives, although no experiments have yet been conducted in this direction. It may be possible to use Mealorub directly without solvents or plasticizing or as solutions in rubber solvents. There is also the possibility of working with liquids other than rubber solvents.

When using Mealorub, mixed with chemicals or resins, as a direct molding powder, it must be kept in mind that

[1]Abstracted from circular received from Proefstation West-Java, Buitenzorg, Java, Netherland India.

the particles are coated with a non-adhesive layer. The particles can fuse together or with other substances only at relatively high temperatures of about 140° C. or higher. When a non-porous homogeneous vulcanized rubber of good mechanical properties is desired, all the particles must flow together before vulcanization takes place. The production of hard and soft rubber articles is possible through this process, provided the article is not too thick to prevent homogeneous heating of the molding mixture.

Mealorub offers a means for studying the effect of the addition of rubber to synthetic resins and of synthetic resins to rubber. Studies in this field will be of considerable interest with a view to modifying the properties of rubber, for instance to make it more oil-resistant and, on the other hand, to altering the properties of synthetic resins in order to make them more elastic.

Patent Position

The Proefstation West-Java has not applied for any patents on processes for application of Mealorub, or has it any intention of doing so in the future. However, those interested in using Mealorub as a raw material for manufacture should investigate the patent position as many patents which claim the use of rubber powders in general are now in existence; many of these, however, are of doubtful validity. In describing the possible applications of Mealorub, the patent position was not taken into consideration.

Pure Gum Compounds

(*Continued from page* 40)

nary process of freezing are generally attributed to crystallization.

In the accelerated freezing test above described the raw rubber did not pass through the opaque stage, but remained transparent throughout the period of the test (four hours). At — 60° C. the transparent rubber was so brittle that it could be shattered like glass by a light blow. Furthermore it resumed its flexible condition when the temperature was allowed to rise to — 30° C.

Summary of Results

(1) High and normal sulphur pure gum compounds became board-like and brittle within a few minutes when cooled at — 60° C.; yet when tested at this temperature they had an elongation of over 500% and tensile strength of over 5,000 pounds per square inch.

(2) With decreasing temperature the two compounds gave increasing tensile strength and modulus and decreasing elongation.

(3) Relatively high combined sulphur, i.e. up to over 8% on the rubber, was accompanied by a marked increase in hardness, even at temperatures no lower than — 30° C.

(4) A substitution of deprotenized rubber for smoked sheet appeared to give greater resistance to hardening at temperatures down to — 40° C.

(5) Unvulcanized, unmilled, smoked sheet showed a greater resistance to hardening on rapid cooling than the vulcanized compounds at all temperatures tested. This phenomenon, however, is not to be confused with that of ordinary frozen rubber, which is commonly observed at temperatures above — 30° C.

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A. Khvostovskaya and B. Margaritov, *Rubber Chem. Tech.*, 8, 522 (1935).

Largest Rubber Calender?

IN PAGE 36 of the October 1, 1938, issue of INDIA RUBBER WORLD, when describing the new branch plant of the Armstrong Rubber Co., Inc., at Natchez, Miss., we referred to "a 28- by 84-inch four-roll calender said to be the largest rubber calender in the world."

Your editor has just received a letter stating that in 1927 Francis Shaw & Co., Ltd., Manchester, England, built a 32- by 92-inch four-bowl calender for the Rapson Tyre Co., Tasmania, and that this machine is understood to be still in production at the Dunlop factory in Australia.

A description of the Shaw calender states that it is for treating both sides of the fabric simultaneously. "By supplying the calender with appliances for building up the fabric on the calender direct from the beam or spool, a weftless fabric can be obtained at one operation direct from the cord to the finished article skimcoated on both sides. All gearing is machine cut and of double helical design and arranged for a fabric speed up to 50 yards per minute. All three adjustable rollers are operated by motors. All bearings are lubricated by a pressure feed system."

32- by 92-Inch Four-Bowl Calender Built in 1927 by Francis Shaw & Co., Ltd.

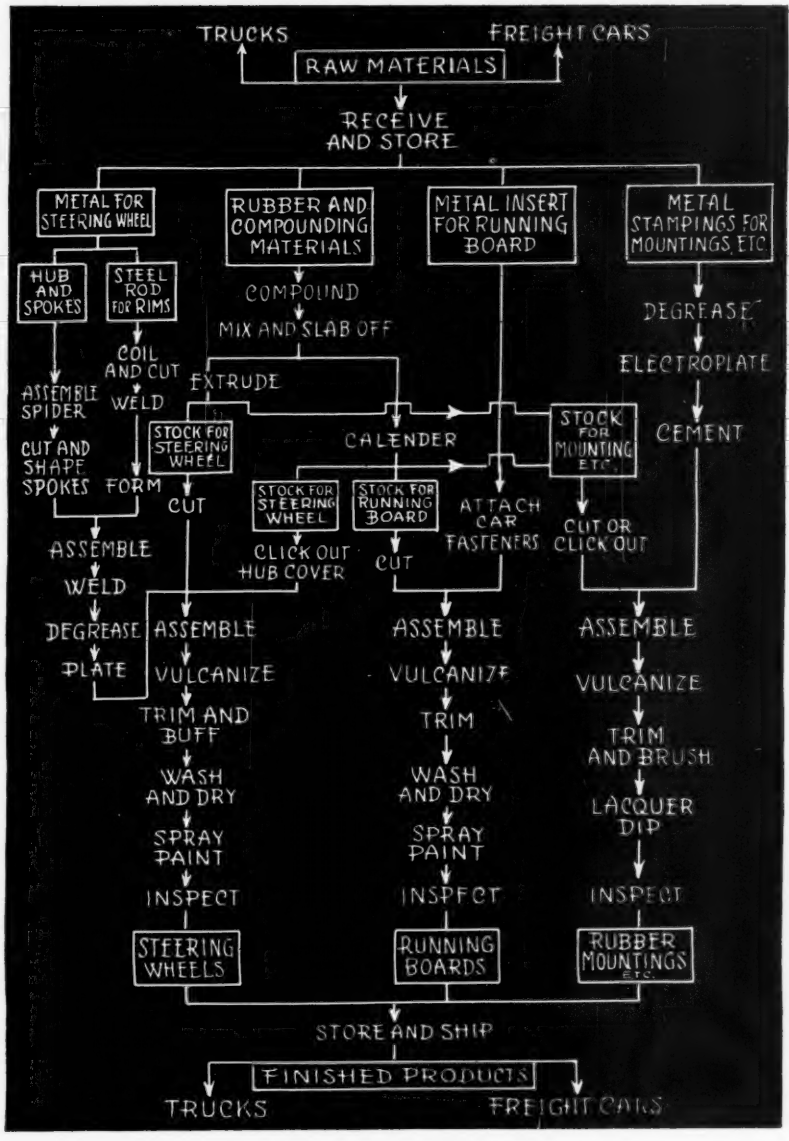
As it is the desire to record all new and unusual developments in connection with the Rubber Industry, INDIA RUBBER WORLD expresses its appreciation to Francis B. Shaw, director of Francis Shaw & Co., Ltd., for submitting this information, and hopes that its readers will continue to assist in the publication and recording of facts which are essential to the completion of the historical files covering the Rubber Industry.

Inland's New Rubber Plant

Rubber and Metal Are United by Conveyerized Straight-Line Methods

E. V. Osberg

A BRIEF review of the patent literature will show that the problems pertaining to the use of rubber in conjunction with metal have intrigued inventors for many years. Not until recently, however, have the major obstacles been overcome, and modern science, stimulated by the demand for quieter and better riding automobiles, has discovered satisfactory ways of uniting these two materials. As a result, the automobile of today has hundreds of rubber parts which have contributed measurably to progress in this field. With satisfactory basic methods of union available it was only necessary to apply modern straight-line production principles to achieve the vast output required by the automotive industry and the efficiency needed for maintaining low automobile prices.



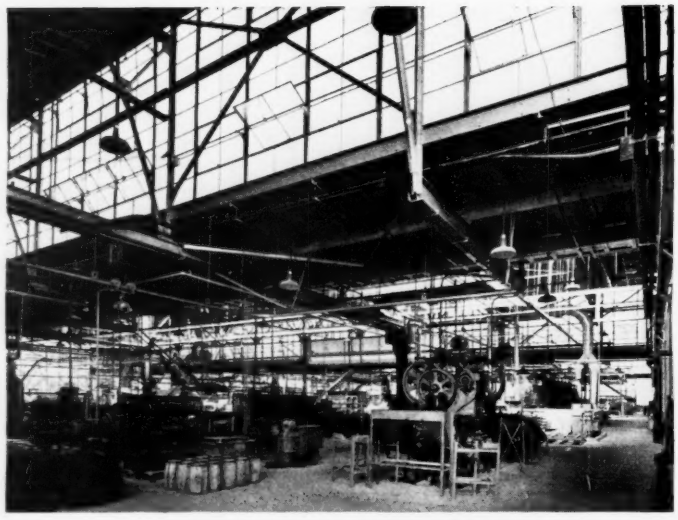
Production Flow Sheet

A significant achievement in this field is the recent completion of the eastern plant of the Inland Mfg. Division, General Motors Corp., at Clark Township, Union County, N. J., where it occupies 137,000 square feet on an 80-acre plot along the Lehigh Valley Railroad. The new plant, which will serve eastern customers and General Motors assembly plants at Linden, N. J., Tarrytown, N. Y., Buffalo, N. Y., Bloomfield, N. Y., Baltimore, Md., and abroad, began, on October 1, 1938, the production of rubber-to-metal automotive parts. Present production, which is limited to three principal lines, on a monthly basis amounts to: 26,500 steering wheels; 36,000 running boards; and 160,000 rubber mountings and similar small parts. Present maximum press capacity on the same basis follows: 50,000 steering wheels; 108,000 running

boards; and 200,000 rubber mountings, etc. In the design of the plant ample provisions have been made for future expansion.

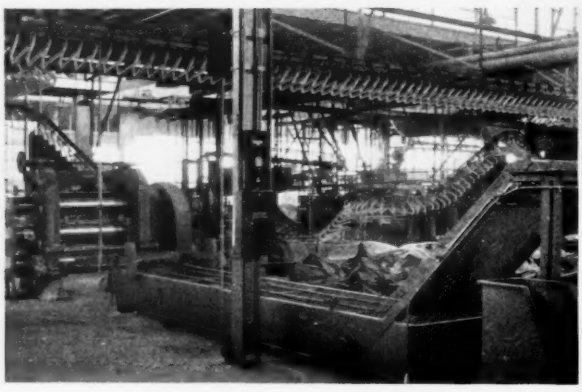
Plant Layout and Design

The building, a one-story structure of modernistic appearance, is 450 feet long and 250 feet wide and has an exceptionally large window area of 56,700 square feet, or a total of 14,400 panes of glass. The roof is of the monitor type, cantilever supported, which requires a minimum of supporting posts to provide large unobstructed areas. Along the front wall, extending lengthwise of the building, are the offices, locker rooms, and laboratory. The remaining space, with the exception of the boiler room, machine shop, and paint supply room, is essentially one large open room, 93,500 square feet in area, and is used entirely for production, receiving, storage, and shipping. To promote cleanliness the area used for compounding is enclosed within windowed walls. The area used for paint spraying the steering wheels is likewise enclosed to exclude dust particles which would impair the paint finish. Two freight-car sidings located within and along the opposite end walls of the building and similar provisions for trucks facilitate the handling of raw materials and finished products. The three essential production lines extend lengthwise of the building with the rubber mountings, etc., being processed along the rear wall, the running boards through the center area, and the steering wheels adjacent to the offices and laboratory. Supplementary to these three lines is the rubber processing line, located centrally and also lengthwise of the building, extending from the raw material storage area to a central point where rubber enters the main production lines.

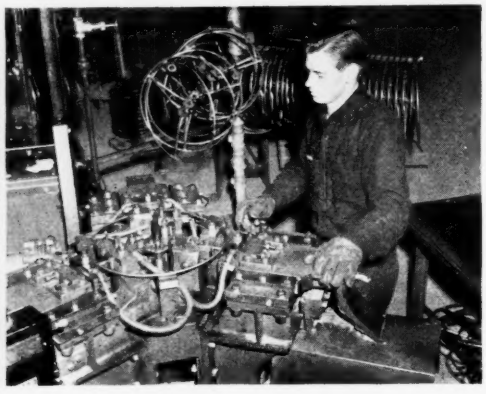


Portion of Production Area

The continuous flow principle has been applied to all production lines. This has been facilitated through the introduction of automatic processing machinery, variable speed mechanisms to provide synchronization of processing units, and an extensive system of conveyers including belt and roller types and suspension units on which wheels, running boards, or trays are transported. Approximately one mile of conveyers has been strategically arranged throughout the plant. The accompanying flow sheet, which also depicts the relative location of processing operations, shows how raw materials are received at one end of the building and are processed by straight-line production methods so that the final steps are performed at the opposite end where the finished products are stored and shipped. Cleanliness and neatness, abetted by careful plant design and continuity of production, are also emphasized.



Calender, Cooling Tank, and Slab Conveyer



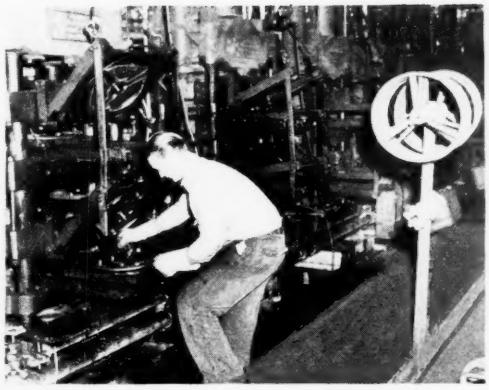
Welding a Steering Wheel

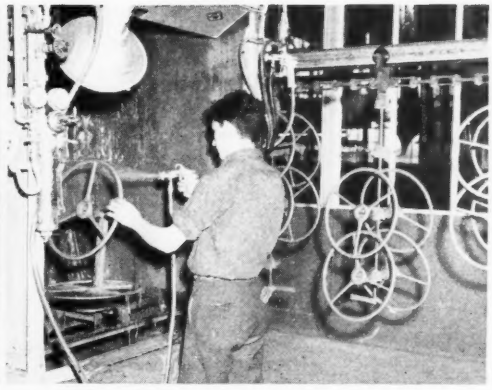
Cutting and Applying Extruded Stock to Rim

Compounding and Mixing

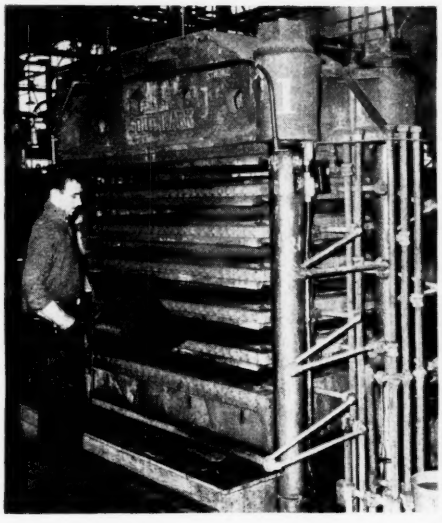
Those compounding materials which are used in relatively large quantities are transferred on an inclined belt conveyer to a balcony where they are dumped into 14 vertical bins which discharge into the compounding room below. Crude rubber bales are placed in ovens where they are held for 24 hours at 175° to 200° F. preceding the time of

Removing Vulcanized Wheel from Press

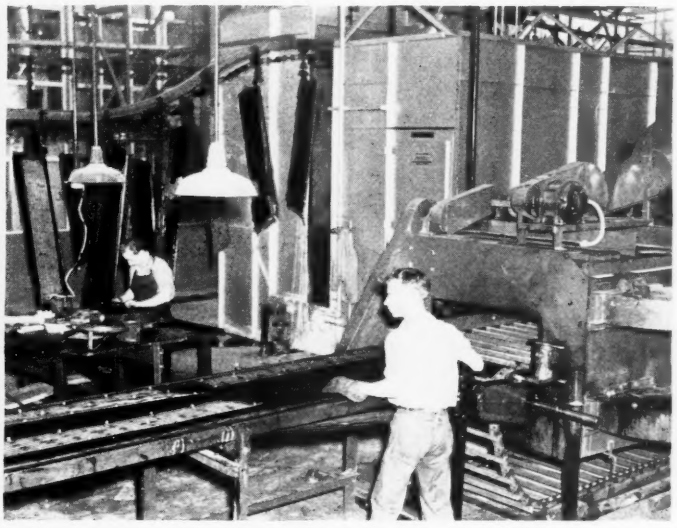




Spraying a Wheel in Water-Washed Booth



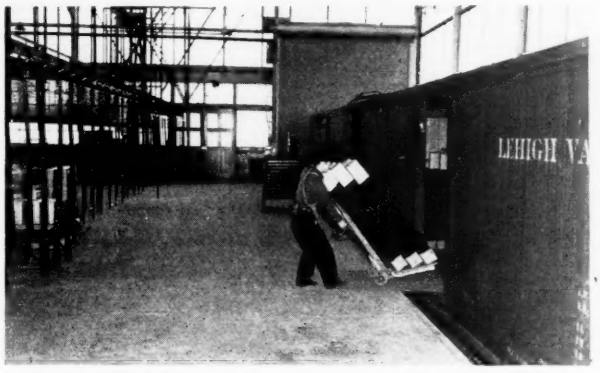
Removing Vulcanized Running Board from Press



Foreground, Running Boards Leaving Drier; *Background*, Entering Spray Booth

mixing. These ovens with horizontal roller conveyers also discharge into the compounding room.

Mixing is accomplished in either a Banbury or on one of the two mixing mills. The Banbury discharges on to a sectional belt-type conveyer which transfers the stock directly forward on to the rolls of a sheeting mill. A hook conveyer, traveling slowly, carries the rubber slabs down through a wet clay bath, kept in suspension by air agitation, and holds them exposed to the air until sufficiently cooled. The final step in the preparation of the rubber stock for the three main production lines comprises either calendering or extrusion, depending upon the shape required.



Left, Finished Running Boards on Hook Conveyer; *Right*, Loading Freight Car

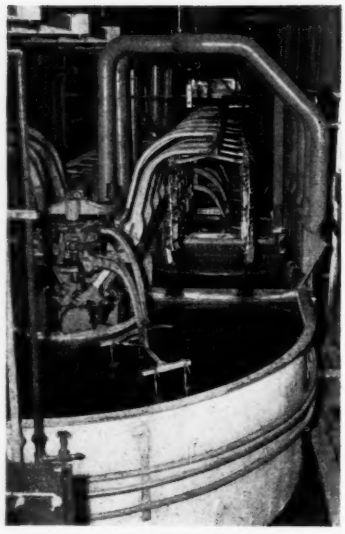
Steering Wheels

The metal insert for the steering wheel consists of a rim section of hot rolled steel, three spokes of cold rolled steel, and a hub of malleable iron. A special machine loops and cuts the rim section from steel rod which is bought in coils, and the two ends are welded together on an electric butt welder. The completed rim is then formed to the correct shape in a punch press. After the spokes are screwed into the hub, the resulting spider is placed in a press where the spokes are bent to the proper shape. The spider is then sprung into the rim section, and the three spokes are welded to the rim in one operation on a special three-point electric butt welder. In order to assure sufficient adhesion between metal and rubber the assembled insert is given a copper plating treatment which comprises the following seven steps: degrease; cold water rinse; pickle (muriatic acid); cold water rinse; copper sulphate dip; cold water rinse; and hot water rinse.

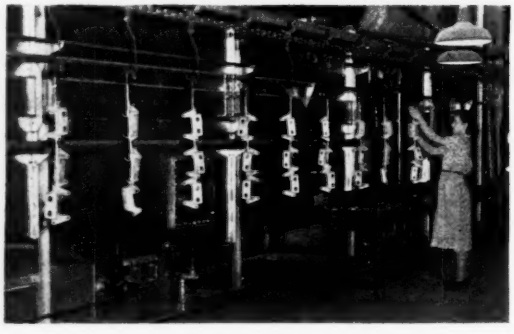
Rubber stock for the steering wheel spokes and rim is extruded through a suitable die to form a tube containing a longitudinal groove into which the metal insert fits. The extruded stock is conveyed through a water-

spray cooling tank to a high-speed rotary cutter, which automatically cuts the stock to the desired length while in motion. Along a continuing conveyer girls assemble the rubber and metal parts, rolling the rim section into the groove of the stock as it comes from the cutter. The speed of the belts in the cooling tank and through the cutter is controlled by a variable speed drive; while the length of the cut is controlled by a second similar drive. The rubber hub covers are clicked out from calendered stock.

Ten four-opening presses are used for vulcanizing the assembled steering wheels. After the cured wheels are trimmed and buffed, a hook conveyer carries them through a spray washer and drier and then to the painting room where they receive two coats of paint; the first coat is dried at 225° F. for 15 minutes, and the second at 275° F. for 57 minutes. There are four paint spray booths in this room, one-half of the production being accommodated in two booths. A continuous flow of water down the inner three walls of each booth collects and agglomerates the excess spray; while an adequate exhaust system removes inflammable vapors. Each booth is equipped with two guns, one for black paint and the other for brown. The paint, which is piped from agitated storage tanks in the paint supply room to the spray guns, is continuously circulated through a return system to insure fresh, well-mixed paint at all times. After careful checking by visual inspection the finished steering wheels are ready for storage or shipment.



Automatic Plating Machine for Small Parts



Plated Parts on Conveyer Before Cementing

Running Boards

When the stock for the running boards leaves the calender, it passes through a cooling tank where it is water sprayed and then through a floating roll compensator to an automatic horizontal knife cutter. The calender roll speed is controlled by means of a rheostat on the D. C. motor drive, while the belt in the cooling tank operates through a variable speed drive which synchronizes the belt speed with the speed of the stock coming from the calender, the belt speed being somewhat lower owing to stock shrinkage upon cooling. Because the stock is not in motion while each cut is being made, the belt through the cutter must travel at a faster speed than the cooling tank belt to compensate for this lost time. This is realized by the use of a second variable speed drive for the cutter conveyer. Both drives, however, are powered by the same line shaft.

The metal inserts for the running boards are received in the form of stampings ready for use. No plating operation is necessary as each insert has received a sufficient coating of copper during the pickling treatment at the steel mill. A staking machine inserts the metal clips used for fastening the running board to the car. The calendered stock is then placed on the top side of the metal insert, and the running board is vulcanized in one of four six-opening presses (two molds to each opening) with special platens to allow for the clips. After trimming, the boards are washed, dried, and sprayed with paint in much the same way as are the steering wheels. In this case, however, the metallic underside only is painted, and the boards travel continuously during the spraying operation.

Rubber Mountings

The smaller rubber-to-metal parts, chiefly engine mounts, are made on the third production line. At the present other parts include: running board insulators, accelerator pedal pads, and transmission supports and guide plates. A hook conveyer carries the metal stampings through a degreaser where organic solvent vapors condense on the cold metal and cleanse the surface of oil and grease. As the degree of adhesion between rubber and metal must be considerably greater than in the case of either steering wheels or running boards, great care must be taken in the plating process which is carried out on an automatic electroplating machine of elliptical design. Fourteen immersion treatments are provided for as follows: (1) electrocleaner (alkali plus electric current); (2) hot water rinse; (3) acid pickle; (4) cold water rinse; (5) electro-cleaner; (6) hot water rinse; (7) acid pickle; (8) cold water rinse; (9) cyanide soak; (10) cold water rinse; (11) brass electro-plating tank; (12) cold water rinse; (13) another cold water rinse; (14) hot water rinse. The plating racks with the metal stampings hooked in place are suspended from the machine arms which move so as to provide successive tank immersions.

The areas of the brass-plated stampings to come in contact with rubber are brushed or sprayed with an adhesive; the spraying is done in the same type of booth used for painting steering wheels. Placed on a tray conveyer, the stampings are carried through a drier to a bench where the rubber and the metal are assembled. Rubber for these parts is prepared in either the extruder or on the calender, depending upon the shape required. Stock is cut to the proper size on a revolving knife cutter, a clicking machine, or a horizontal knife cutter. After assembly the covered parts are placed on another tray conveyer and carried to a battery of ten double-opening presses where they are vulcanized. When trimmed, the parts are dipped into an oil-resistant flexible lacquer and then dried.

Boiler Room

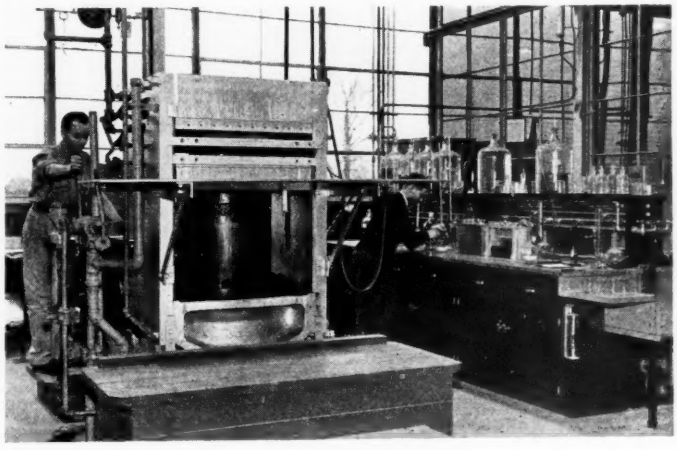
In the boiler room, which projects out from one corner of the building, are located the equipment for providing: hydraulic pressure for press operation; air pressure for removing products from molds and operation of paint spray guns, steam regulators, and some machine parts; and steam for processing operations. Steam is generated

in two oil-fired, water tube boilers. An air compressor pumps 1,346 cubic feet of air per minute at 100 pounds per square inch pressure; while a reciprocating duplex hydraulic pump, electrically driven, has a capacity of 515 gallons of water per minute at 400 pounds' pressure. Another similar pump with a capacity of 200 gallons of water per minute at a pressure of 2,000 pounds operates in conjunction with an accumulator which is loaded with iron ore weighing approximately 1,000,000 pounds.

Paint Supply Room

Paint for both steering wheels and running boards is prepared in a separate room to avert fire hazards and to provide efficient handling of paint supplies. Here 50-gallon drums of paint are fastened in a drum mixer where they are revolved end over end and axially for three hours prior to mixing. Paint and solvent are mixed in an agitator tank and then pumped into a similarly agitated storage tank. A centrifugal pump maintains continuous circulation in a two-pipe system between storage tank and spray booths. Three mixer tanks and three storage tanks with circulatory systems provide black paint for running boards, and brown and black paint for steering wheels. The adhesive cements used for engine mountings and similar small parts are also prepared here in four 50-gallon mixers.

Foreground, **Vulcanized Mountings;** ***Background,*** **Removing Mountings from Press**



View in Laboratory

Laboratory

A close check is maintained on processing operations through careful control in the laboratory which contains the standard apparatus for testing the physical properties of rubber, in addition to the usual chemical laboratory equipment. Experimental batches are mixed on a laboratory mill and cured in a 30- by 30-inch hydraulic press with full factory pressure. Each batch of rubber is sampled, and a small washer-shaped cured specimen is tested for gravity and hardness. The same sample is then placed on a Miller stretch machine[1] which measures the elongation at a definite load.

Located in the machine shop close by, an Olsen tensile tester is used to determine the degree of adhesion between rubber and metal. On engine mountings this value varies from 300 to 1,000 pounds per square inch, depending on the compound used. The same tester is used for determining the strength of welds on the metal steering wheel inserts. The functions of this laboratory include control of raw materials, rubber batches, paints, cements, and plating solutions, while all research is carried out in the main laboratories of the Inland Mfg. Division at Dayton, O.

[1]This machine, originally designed by the Miller Rubber Co., comprises a knife-edge supported lever with four notches on the long arm for suspending the load at different distances from the fulcrum. The sample is placed over the end of the short arm and over a fixed arm below. The weight of the load applied to the long arm separates the fixed and movable short arms, thus stretching the rubber ring sample, and the elongation is measured on a graduated scale as indicated by the pointer end of the long lever arm.

To Avoid Falls

Keep hands free to grip the rails when using stairs or ladders.

Take short paces in slippery places.

Wear good shoes.

Protect yourself with substantial railings when working on scaffolds.

Use a safety belt and line when working where no form of protection is available.

Don't pass up a stumbling block. Remove it.

Avoid untied shoe laces and baggy trouser cuffs.

Avoid running and scuffling. *National Safety Council.*

Back in 1890—

A man who later became President of the United States was running a printing press.

One of America's big steel company heads was stoking a blast furnace.

A famous banker was firing a locomotive.

A railroad president was pounding a telegraph key.

Under the American system there's always room at the top. And many a young man at the bottom today will be at the top 10, 20 and 30 years hence. *The Oak Leaf.*

Editorials

Patent Legislation

DURING the last year much has been heard and read regarding the agitation in governmental circles for changes in the laws governing the issuance, licensing, and usage of patents. The criticism of our present system has been quite largely directed to an assumed practice of suppressing patents which has been laid at the door of industry.

Inactivity in connection with individual patents is not justification for an accusation of suppression. Many patents have been issued which should never have been granted as is evident from the vast number that are declared invalid by the courts as being void of invention or are of a conflicting nature. In numerous instances several patents relate to the same general product or process and are interlocking to the extent that only a portion of the patents are involved in commercial production of the product. Again a great many patents are of no or little commercial value and therefore lie dormant.

What is the basic purpose of granting a patent covering an invention? The prime objective is to record the details so that the art will not be lost, but will be available for future generations. A secondary advantage is that through publication of these inventions, duplication of effort will be minimized and research effectiveness will be most pronounced. For the purpose not of forcing, but rather of inducing the inventor to reveal his accomplishments the government grants a patent which, only after being adjudicated valid by the court, provides protection to the inventor for this his private property which he is and should be free to utilize, trade, or hold dormant to the same extent as though it were still his undisclosed secret.

The obtaining of a patent necessitates an expense to the patentee, and the burden of protecting that patent through the courts is even a greater expense to the patentee or the then owner. The granting of a patent by the federal government is simply a recording and publicizing of the information. The government in no way obligates itself to prosecute those who may use this public information to infringe or compete with the invention which has been made possible through the efforts and disbursement of the patentee. The rightful intent is that the invention remains for a reasonable period of time as the personal property of the inventor to fight for or do with as he desires. It does not appear equitable that any government should attempt to restrict him as any such action, without reimbursement either through guaranteed immunity from infringement or some material award, would border on confiscation.

In the May, 1938, issue, INDIA RUBBER WORLD reproduced the then-attempted patent legislation, Bill H.R. 10068 proposed by Representative McFarlane on March 29, 1938. This bill was not acted upon in the last Congress, and as McFarlane was not returned by his constituents to the present Congress, it is presumed that any future activity will necessarily originate from another source. In spite of reports to the contrary it is expected that early this year the Temporary National Economic Committee (technical name for the Congressional monopoly probe committee) will concern itself with the patent law structure. It is also expected that Patent Commissioner Coe and his assistants will present case histories of patent experience.

Before making any changes in our patent system, extreme care should be exercised to prevent alterations which would render a granted patent less valuable or which might foster a practice of utilizing the invention in secrecy without applying for a patent. The incentive to invent and to register that invention in the form of a patent should be increased rather than retarded.

A valuable service can be rendered through changes in the manner of administering the present system so as to eliminate the issuance of patents which are by nature subject to later invalidation by the courts or which tend to create an involved and interlocking patent situation relating to a single subject. In many cases the laxity in granting patents has resulted in such an existence of numerous and interrelated patents that all become of questionable value or the expense of proving their validity is unproportionately high and the patents are rendered ineffective for any practical use. Rather than by attempting to isolate and prevent non-use of patents, legislation can render valuable service to the people by strengthening the system so as to insure validity and increase the protection to the patentee, thereby increasing the desirability of and the reward for useful application of the invention.

Inasmuch as the major portion of existing patents has been granted to those connected with industry and has been applied to the production of useful articles through the efforts of industry, any patent legislation becomes of material interest to those who are engaged in business or industrial activities. Manifestation of the views and desires of those interested, if made before legislation has been enacted, will enable a more complete understanding of the practical effect of such changes as may be contemplated by the present Congress.

S. C. Stillwagon

EDITOR.

What the Rubber Chemists Are Doing

A.C.S. Rubber Division Activities

Akron Group

THE mid-winter meeting of the Akron Group, Rubber Division, A.C.S., was held January 20 at the Elks Club, Akron, O., with 258 present at the dinner, and an unusually large crowd for the meeting which followed. Wm. Welch, president of Midwest Rubber Reclaiming Co., East St. Louis, Ill., presented his motion picture, "Rubber Reborn," which was preceded by his paying tribute to his old friend, F. A. Seiberling, who sat beside him. Mr. Welch emphasized his faith in Akron as the present and future center of the Rubber Industry and also characterized the picture as representing the practice in other modern reclaiming plants as well as in the Midwest factories. This outstanding industrial picture illustrates the fact that the reclaiming industry is an important national asset as an emergency supply of an extended portion of our rubber requirements.

The next speaker, Dietrich Rempel, an artist at the Sun Rubber Co., Barberton, O., gave an interesting account of his experiences as a boy during the Russian Revolution. His brother was killed by the revolutionists, and his parents died as the result of the hardships. He and some other members of his family were brought to the United States through the efforts of relatives already in this country together with the help of the Relief Commission working at that time under the direction of Herbert Hoover.

The next meeting of the group is scheduled for March 24 at which time W. J. McCortney of the Chrysler Corp., will speak on "What the Automotive Industry Expects of the Rubber Chemist."

Chicago Group

THE Chicago Group, Rubber Division, A.C.S., will hold its next meeting on February 10 at the Hotel Sherman, Chicago, Ill. Following the dinner and floor show in the hotel's College Inn, the group will adjourn to the Crystal Room where J. K. Stewart and D. D. Rubek, of the Anderson-Prichard Oil Corp., will speak on "The Practical Application of Petroleum Solvents for Rubber Cement." The speakers will have on exhibit certain machinery which will be in operation to show its use for various types of rubber cements.

Boston Group

THE Boston Group, Rubber Division, A.C.S., will hold its next meeting on Friday evening, March 3, with dinner at 7 o'clock. The new meeting place, Restaurant Seville, is located at 130 Boylston St., Boston, Mass., opposite the Common near the corner of Tremont and Boylston Sts.

With a desire to hold the price of dinner tickets within a range attractive to the younger technical men in the rubber industry, the officers of the group report that they have been able to arrange for an unusually excellent dinner and unique quarters at a decidedly reduced price, the exact amount to be announced later.

Two papers relating to rubber will be presented. One of the papers by Dr. Wm. F. Tuley, of Naugatuck Chemical Division of United States Rubber Products, Inc., on the subject "Twentieth Century Shadows of Charles Goodyear" will apply particularly to accelerators and their uses. The other paper will be announced later and will be on another subject connected with rubber.

Rubber Division Meeting

THE Rubber Division, A.C.S., will meet on Wednesday and Thursday, April 5 and 6, during the spring meeting of the American Chemical Society which will be held at Baltimore, Md., April 3 to 7. The heaquarters of the Rubber Division will be in the Emerson Hotel.

A part of the division program will be devoted to a symposium on synthetic rubber and elastic polymers. The symposium will be restricted probably to two sessions or one day's meeting; the balance of program will be given over to the presentation of papers of a more general nature. It is suggested that papers pertaining to vulcanization be withheld until the Boston meeting, next fall, when this subject will be the keynote of the Goodyear Centennial Program. Papers for the spring meeting should be sent to H. I. Cramer, division secretary, University of Akron, Akron, O. The deadline for receiving papers has been set for Saturday, February 18, but those who intend to prepare papers should inform the secretary immediately.

In submitting papers four copies together with an abstract of 200 words or less are required. All divisions are endeavoring to improve the quality of abstracts as the original copies are printed in the Bound Abstracts for each General Meeting of the Society. The abstract should set forth the purpose of the work, the important results, and the conclusions. Members who have paid their dues will receive receipt cards from the secretary which will entitle them to purchase complete sets of abstracts of papers at the Baltimore or Boston meeting, at one-half the regular price, or 50¢.

S.C.I. Meeting

THE American Section, Society of Chemical Industry, will meet February 10 at 8:00 p.m. at The Chemists' Club, 52 E. 41st St., New York, N. Y., jointly with the American Chemical Society. Dr. Wallace P. Cohoe, chairman of the American Section, will preside over the meeting, at which Dr. Wanda K. Farr, Director of the Cellulose Laboratory of the Chemical Foundation at Boyce Thompson Institute, will speak on "Viscose Rayons." A dinner will be held at the club, preceding the meeting, at 6:45 p.m.

Rhode Island Rubber Club

PRECEDED by an assembling of the bowling enthusiasts at the Casino Bowling Alleys, the Rhode Island Rubber Club held an interesting meeting on January 13 at the Narragansett Hotel, Providence, R. I., with 89 members and guests present. After the dinner Charles Berlow, president of the club, introduced Dr. Norman A. Shepard, director of technical service for American Cyanamid & Chemical Co.'s Laboratories, Stamford, Conn., who exhibited slides and described the arrangement and equipment utilized by the staff of 275 in the laboratory which covers 225,000 square feet of floor space. After defining the activities of the various laboratory divisions, Dr. Shepard discussed the characteristics of Cyanamid's new rubber activator, Aero Ac 50.

The next speaker was Lewis Bellem, Jr., who, early in 1938, installed on Pitcairn Island new radio equipment valued at approximately $5,000 and donated by various manufacturers of

transmitting equipment. Mr. Bellem gave a most interesting description of life on the island and showed four reels of pictures of the inhabitants, who include 200 persons belonging to 70 families with only 7 family names, most of whom are descendants of the original mutineers.

The Wishnick golf trophy, held by Anaconda Wire & Cable Co. from 1937, was presented to Respro, Inc., the winner for the 1938 season. The evening's bowling prizes were awarded as follows: high singles, first prize to Arthur Davis, of Goodyear Footwear Corp., and second prize to Del Gifford, of Sessions Gifford Co.; high three strings first prize, to Frank Donovan, also of Sessions Gifford Co., and second prize to Mr. Demer. The recipients of door prizes were: Robert Kelly, of Converse Rubber Co., a radio; W. O. Hammister, of Naugatuck Chemical, an electric grill; L. G. Whittemore, of L. G. Whittemore Co., an electric toaster; Mr. Youse, of Firestone's Fall River Plant, a thermometer; and B. R. Whaley, also of Firestone, a traveling bag. The traveling bag was donated by Ernest Jacoby & Co., and the other gifts were purchased with money remaining from donations made for the previous meeting, which was held on October 21, 1938.

Delayed Action Activator

Aero Ac 50, a development of the American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y., is a new delayed-action activator or secondary accelerator for use with mercaptobenzothiazole or its derivatives. The new chemical is the reaction product of two moles of diorthotolylguanidine and one mole of zinc chloride produced in the form of an amorphous powder with a softening point range of 76 to 82° C. As a result of this low softening point, Aero Ac 50 disperses readily in rubber, and when it is used with D.P.G. or D.O.T.G., such combinations may be varied to give different curing rates and freedom from scorching at processing temperatures, it is claimed.

Hydrogenated Resin

STAYBELITE, commercially available hydrogenated rosin, is suggested for use in rubber compounds wherever a non-oxidizing rosin is desired. It consists of partially and completely hydrogenated acid and non-acid constituents of rosin and is much paler in color than the original rosin. Because of its saturated nature Stabelite resists oxidation and ultra-violet rays, retaining its original color to a marked degree when exposed to air and light. Two grades are available, Stabelite A-1 and A-2; the former is lighter in color. The following table presents a typical analysis of the two grades:

	Staybelite A-1	Staybelite A-2
Acid number	167	162
Saponification number..	169	168
Unsaponifiable	7.5%	8%
Petroleum ether insoluble	0.2%	0.2%
Color (Lovibond)	5 amber	13 amber
Melting point (drop)...	175° F.	171° F.

The use of Staybelite for certain adhesives is suggested because of its light color and because it does not become brittle with age. Surgical tapes, and other adhesive tapes, are said to retain their effectiveness under long storage when Staybelite is used. Other suggested uses include: paper sizing and coatings; a modifier for synthetic resins; and electrical insulation compounds.

Cement for Attaching Rubber Tile

Ruggedwear Primer, a new bonding material processed with cellulose, is said to be suitable for attaching rubber tile to nearly any type of floor surface. In addition it may be used for attaching rubber treads on stair steps as well as treads on automobile running boards. As the cement is in a condensed form, it is necessary to thin with 10 to 30% water before using. Application can be accomplished with an ordinary paint brush. The primer is said to be able to withstand severe vibration and still maintain a tenacious grip.

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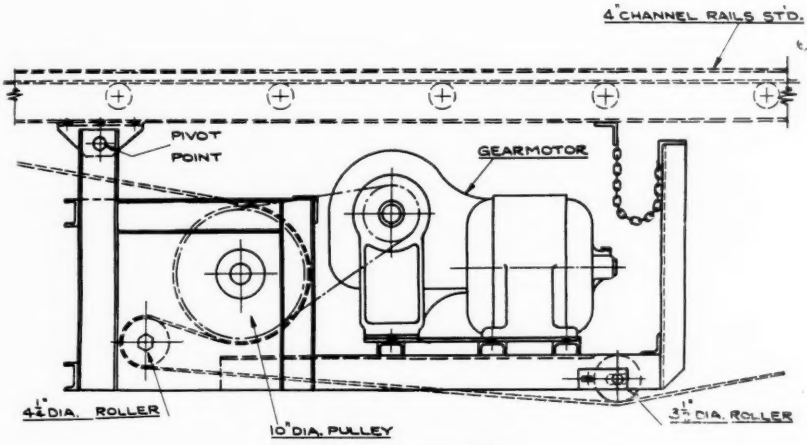
New Machines and Appliances



New Type Conveyer Drive

Floating Drive for Conveyer Belt

A PATENT application has been filed on a new type of conveyer belt drive which is suspended under the conveyer frame by means of a pivot at one end so that the weight of the free or floating end of the drive mechanism applies tension to the conveyer belt. As shown in the sketch, the 10-inch pulley for driving the belt is connected to a gearhead-type motor, maximum belt wrap being secured through a 4¼-inch roller. The detached end of the drive frame rests on the belt through a 3½-inch roller.

This type of construction permits the drive to be located at any point along the length of the belt conveyer; whereas the conventional method dictates that the drive be located at the head end of the conveyer. The floating nature of the drive is said to provide for a minimum tension with an unloaded belt, the tension increasing automatically as the belt is loaded; while in the case of the head-end, take-up type of construction the screw type take-ups employed are adjusted so as to apply the maximum belt tension at all times.

Fuel Loss Chart

A REASONABLY accurate chart for obtaining boiler fuel losses from the CO_2 content and the temperature of the flue gas is shown in the accompanying illustration. To use the chart simply zigzag a ruler from left to right, as indicated by the dotted lines, and the losses are found at the ruler intersection with column G.

As an example, the coal used in a certain plant has a fuel value of 13,500 B.t.u.'s per pound and has a carbon content of 85%; the flue gas has a CO_2 content of 7% and a temperature of 600°F; the temperature of the air entering the furnace is 75°F. When using the chart as shown by the dotted lines, obtain the intersection on column C of a straight line running through 13,500 B.t.u., column A, and 85%, column B; obtain the intersection on column E of a straight line running through the above intersecting point on column C and 7%, column D; a straight line running through the intersecting point on column E and 525° F. (difference between fuel gas temperature and ingoing air temperature) will intersect column G at 27.7%, the fuel loss resulting from the specified CO_2 content and temperature of the flue gas. A second set of dotted lines refers to the same fuel, but improved furnace conditions with a CO_2 content of 12% and a flue gas temperature of 500° F. By applying the chart in the same manner, the fuel loss, in column G, will be found to be 13.7%.

Add-A-Bin Assembly

Filing System for Small Parts

THE Add-A-Bin, a system of separate unit bins assembled by the user to fit his individual needs, provides a compact and efficient means for storing screws, bolts, nuts, washers, rivets, staples, pins, and the innumerable small parts required by the average mechanic. The bin housing may be screwed to a wall, bench, or to a panel which may be fashioned into a portable kit. Each bin is so balanced that the weight of its contents causes it to close automatically. By lifting the bin slightly when

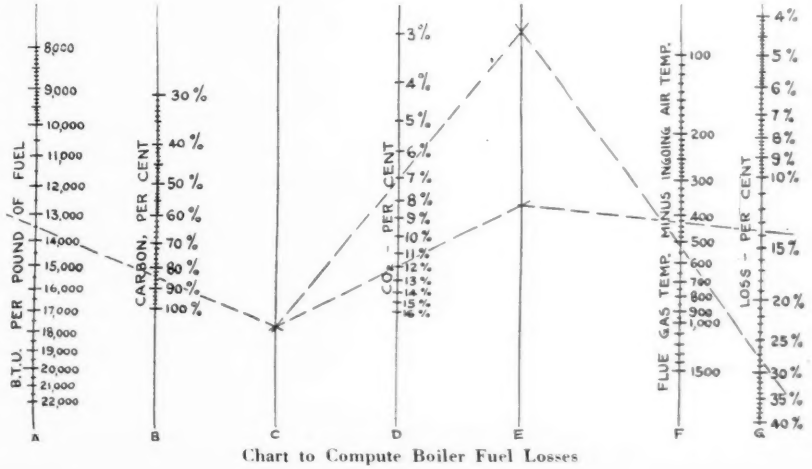


Chart to Compute Boiler Fuel Losses

open, it will lock in this position, and to remove the bin for cleaning it is lifted higher. The bins are of welded construction, using 26-gage steel, with a green enamel finish and are made in two series. The three-inch bins are all two and one-half inches deep, three inches high, and three, six, or nine inches wide. The four-inch bins are all three inches deep, four inches high, and four, eight, or twelve inches wide. Noggle Products Corp.

Fire Hose Nozzle

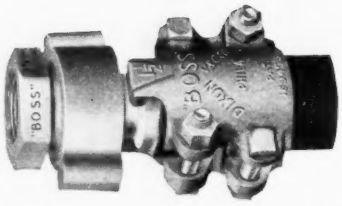
A NEW type of nozzle for general use on fire hose lines permits the use of water in large quantities for extinguishing all classes of fires, including fires in oils and in high-voltage electrical equipment. Known as the Poweron nozzle, it discharges water in a form that is said to be more effective than a solid stream of water and maintains a water curtain between the operator and the blaze. The nozzle is non-adjustable, which construction prevents the formation of either a solid stream or an ineffective spray.

Tests by the Underwriters' Laboratories, Inc., approve the new nozzle for use in applying water on fires in ordinary combustible materials, flammable liquids, and electrical apparatus carrying voltages as high as 250,000. According to the Factory Mutual Laboratories, the Poweron nozzle is of value for fires with flash points as low as that of kerosene oil and, under favorable conditions, will extinguish fires in more volatile liquids. American-LaFrance & Foamite Industries, Inc.

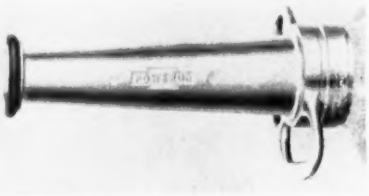
Windowed Hood for Laboratory Mill

A SIMPLE device to prevent dust-promoting compounding materials from flying into the air when being mixed into rubber on a laboratory mill consists of a single piece of sheet metal bent to the shape of the mill top as shown in the accompanying illustrations. A hole cut out over the mill rolls is fitted with a cellophane window fastened at the top edge on to the metal with adhesive tape. To install, it is only necessary to place the hood over the mill.

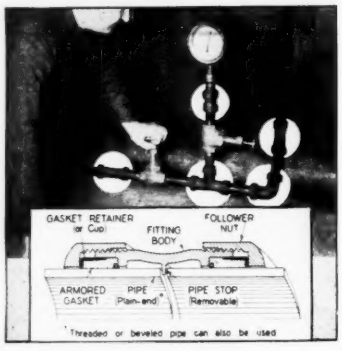
In operation the rubber is put on the rolls, and the materials are added in order until the carbon black or similar dusty material is about to be incorporated. The hood is then placed over the mill and the powder shoveled through the window. The mixing operation on the rolls can be observed through the cellophane window. After incorporation is complete, the hood is removed, and the batch mixed as usual. In addition to its use for finely divided materials like carbon black it can also be employed to advantage for substances like mineral rubber which tend to jump or snap out of the mill rolls. The hood was designed by the laboratory staff of the Midwest Rubber Reclaiming Co.



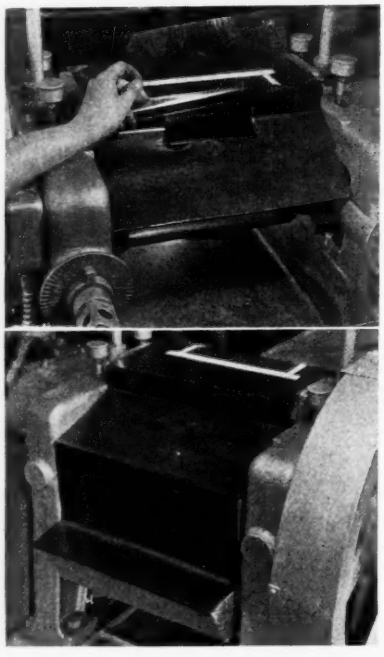
Coupling Equipped with Off-Set Clamp



Poweron Fire Hose Nozzle



No-Thread Pipe Fittings; Sketch Shows Working Principle



Top, Front of Mill Hood Showing Cellophane Window; *Bottom,* Rear View Showing Extension of Hood to Pan

Leak-Proof Hose Clamp

THE Boss Off-Set, a clamp of improved design, is now being furnished with Boss hose couplings, sizes one inch or larger. Instead of the bolt lugs being in alinement, they and the dovetailing fingers of the intersecting halves are set in a staggered, or offset, relation to each other. This allows the clamp to grip evenly on the entire circumference of the hose, thus preventing a straight-line leak. The clamps are provided with a new intergripping surface, which is more effective in gripping and less destructive to the hose cover. The rear intersurface of the clamp is slightly flared to allow for expansion at the end section. Dixon Valve & Coupling Co.

Pipe Threading Eliminated by Standard Fittings

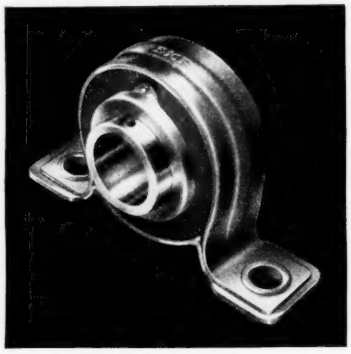
CUTTING pipe to exact lengths, threading, grooving, flaring, or screwing up joints in cramped quarters is eliminated through the use of recently developed No-Thread pipe fittings. After inserting the plain-end pipe into the fitting it is only necessary to tighten two threaded octagonal follower nuts with a few turns of a wrench. As this work is done, resilient armored gaskets at each end of the fitting are compressed tightly around the pipe, forming a positive seal. The resulting joint is not only permanently tight, but absorbs normal vibration, expansion, and contraction movement, and permits deflections of the pipe in the joint. If the pipe is already threaded, it can also be joined in the same way. The complete line of fittings includes: standard and extra-long couplings; 45° and 90° ells; and tees, all in standard steel pipe sizes from ½-inch to two inches, inside diameter. S. R. Dresser Mfg. Co.

Chlorinated Rubber Finishes

ROXAPRENE is the name given to finishes with a chlorinated rubber base for both decorative and corrosion-resistant coatings. The new finishes may be air dried or baked; baking is accomplished in 30 minutes at 250° F.; steam oven drying requires one hour at 180° F.; while in the case of air drying the finish sets dust-free in 15 minutes at room temperatures, setting to a firm, glossy finish in six hours. Roxaprene is best applied by spray and has excellent adhesion to clean steel, aluminum, and die castings. A tough, mar-resistant finish is produced with sufficient flexibility to prevent chipping under severe impact. Used as a corrosion-resistant coating, the new enamels withstand immersion or spray treatments of alkalis, acids, alcohol, and salt solutions. Tests have indicated that they also successfully withstand

(*Continued on page* 58)

New Goods and Specialties



Rubber-Flex Pillow Block

Sound-Insulated Pillow Block

THE Rubber-Flex pillow block, sound-insulated and compact, comprises a self-locking bearing encased in a pressed steel housing with felt seals to exclude dirt and with means for lubricating the bearing. The bearing and housing are surrounded with an annular rubber cushion formulated so as to provide special sound-absorbing characteristics and resistance to the action of oil and grease. The bearing is inherently alining, thus compensating for inaccuracies of set-up and conditions of shaft misalinement without binding or impairing the load-carrying capacity of the bearing.

The unit is said to be free from objectionable vibration and to carry substantial loads under practically all operating conditions. These pillow blocks which are being made in the ¾- and one-inch shaft sizes, constitute rugged, inexpensive units for wide application in those fields requiring anti-friction bearings with unusually quiet operating characteristics, according to the manufacturer, SKF Industries, Inc.

Condor Marine Exhaust Hose

CONDOR marine exhaust hose, fabricated from rubber and duck, has been introduced as a substitute for cast-iron, steel, and copper exhaust pipes on motor boats. The inner tube of the exhaust hose is of heat-resisting rubber; while the outer cover is rugged and oil-resisting. Between its plies of strong duck is embedded a spirally wound wire to prevent collapse and to withstand pressure. Designed for wet exhaust on either Diesel or gasoline engines, the new hose is said to combine flexibility and ease of installation with

Condor Marine Exhaust Hose

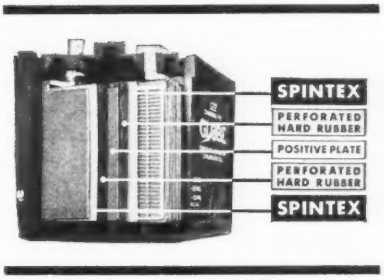
physical properties that have many advantages over metal pipe.

Metal exhaust pipes on crafts operating in salt water become quickly pitted and corroded. In both salt and fresh water a weak sulphuric acid, formed when particles of unconsumed fuel mix with water, has a rapidly deteriorating effect on metal pipe. Besides being immune from the effects of weak sulphuric acid and salt water, it is claimed that Condor hose acts as a dampener to noise and vibration. Owing to its flexibility the new hose can be bent around obstructions, and since it does not readily transmit heat through its walls, as does metal pipe, Condor hose eliminates the danger of discoloring and blistering adjoining partitions and bulkheads. The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.

Dual Insulated Storage Battery

A DUAL insulation for semi-heavy-duty storage batteries consists of

U. S. Royal DeLuxe



Cross Section of Globe Battery

thin, perforated, hard rubber sheets on both sides of the positive plates to hold the oxides firmly in place and special all-rubber, ribbed sheets, known as Spintex, which permit the acid to rise and circulate rapidly between the ribbed partitions, and around and over the positive plates. The cross-section view of a typical insulated plate assembly shows how the cell groups are built up with this type of insulation. The batteries are assembled in durable hard rubber containers with a liberal space above and beneath the plates to permit utilization of a large volume of electrolyte.

This type of construction is said to be suitable to resist the vibration, wear, and high temperatures encountered in commercial service on light trucks, taxicabs, delivery cars, etc. In addition, the high degree of porosity of the insulation permits the fast circulation of power creating electrolyte. Globe-Union Inc.

Tire with Double-Action Tread

THE recently introduced U. S. Royal DeLuxe tire features a new double-action tread which is in effect a tread within a tread. In addition to a six-row non-skid block design, the new tire has a secondary tread consisting of a multiplicity of angular incision-like depressions in the surface of the middle four ribs. This secondary tread is effective only when the brakes are applied; the slots open up to provide 2,500 sharp gripping edges. When the car is cruising, they close up to form smooth quiet rolling ribs. The individual blocks in the primary tread have been varied in length so that impact sound cannot be built up to a disturbing audible pitch; while the grooves have been designed for ejecting embedded stones to overcome their noisy click on the road surface. U. S. Tire Dealers Corp., 1790 Broadway, New York, N. Y.

Rubber Industry in America

LEGAL

Latex Patent Decision by Court of Appeals

In the May, 1937, issue, INDIA RUBBER WORLD published the verbatim decision rendered April 23, 1937, by the District Court of the United States, District of Massachusetts, in the suit between Vultex Corporation of America et al and Heveatex Corporation et al.

As the result of an appeal filed in January, 1938, Judge Wilson of the United States Circuit Court of Appeals for the First Circuit handed down on January 10, 1939, a ruling which confirmed the District Court decision except that Judge Wilson now declared the second patent in suit, No. 1,682,857, as valid. Both patents No. 1,443,149 and No. 1,682,857 are now adjudicated valid, but not infringed.

Below are given verbatim excerpts from the official decision which appear to indicate the essence of the opinion.

United States Circuit Court of Appeals
for the First Circuit
October Term, 1938

No. 3315
Vultex Corporation of America et al
Plaintiffs, Appellants,
v.
Heveatex Corporation et al
Defendants, Appellees
Appeal from the District Court
of the United States
for the District of Massachusetts
Before Wilson, Morton and Peters, JJ.
Opinion of the Court
January 10, 1939.

Wilson, J. This is an appeal from a decree of the District Court of Massachusetts dismissing two bills of complaint which were tried together. The two cases have been consolidated on appeal. Both cases involve processes for vulcanizing the rubber particles in suspension in the milky sap of the rubber tree, which is known as latex. The crude rubber of commerce is obtained by coagulating or separating the solid rubber particles from the latex.

The two patents in suit describe processes for vulcanizing the rubber particles in suspension in the latex and before coagulation. Prior to the patents in suit there were two processes used in vulcanizing rubber known in the art as "hot vulcanization" and "cold vulcanization." . . .

Under the first patent in suit, No. 1,443,149, issued to Dr. Phillip Schidrowitz in 1923, on an application filed in February, 1922, it is claimed that he discovered that it is possible to vulcanize rubber in the liquid latex without coagulation or separation into crude rubber.

Under the second patent in suit, No. 1,682,857, issued to Dr. Schidrowitz in 1928, on an application filed in March, 1923, it is claimed that the discrete particles of rubber, which are separated in the latex from each other by water, may be caused to combine with the sulphur, which is not soluble in water and at temperatures below the melting point of sulphur. He discovered that the sulphur penetrates the outer shell of the discrete rubber particles in suspension in the liquid latex, and with the aid of "low temperature" accelerators vulcanizes the contents at temperatures below the boiling point of water.

It is apparent from the specifications of the Letters Patent and in general from the description of the processes involved in the two patents in issue, that the first patent in suit proposed vulcanization of the particles of rubber suspended in the latex by the "hot vulcanization" process, and the second patent in suit proposes to accomplish vulcanization by what is termed a "cold vulcanization" process.

Each method in the respective patents in suit differs from the method in use prior to Dr. Schidrowitz's alleged discoveries, in that the vulcanizing ingredients act upon the rubber particles in suspension in the liquid latex instead of upon the rubber particles after coagulation or separation from the latex in the form of dry milled crude rubber.

The first case involves claims 8, 9, 19, and 20 of Letters Patent No. 1,443,149; and the second case involves claims 7, 8, 12, and 16 of Letters Patent No. 1,682,857—all process claims. The District Judge held that as to the patent No. 1,682,857 that the claims were not not infringed; and in the second patent No. 1,682,857 that the claims were not valid, but, if valid, were not infringed.

We think the ruling of the District Judge was correct on the evidence that there was no infringement of patent No. 1,443,149, there being no evidence that the defendants did anything more than compound the liquid latex with sulphur and certain accelerators, but did not subject the compound to heat or pressure or to any of the vulcanizing steps described in the first Schidrowitz patent in issue. . . .

The plaintiffs in their brief to this court say:

"The usual practice of Heveatex Corporation in selling 'Formula C' and Type 'IC' is to mix the ingredients on receipt of an order and to ship the compounded latex promptly. It is the usual practice of users, who order fortnightly, to vulcanize the rubber obtained from the latices by coagulation. This is not the practice complained of.

"The acts complained of were the shipments of latex substantially vulcanized when they left the place of business of the defendant, Heveatex Corporation. This and this only is the infringement complained of." . . .

In general, the procedure indicated in the second Schidrowitz patent, No. 1,682,857, differs from the procedure set forth in the first Schidrowitz patent, No. 1,443,149, in the same way that the so-called "cold vulcanization" process, when applied to crude rubber, differs from the so-called "hot vulcanization" process applied to crude rubber.

It is conceded that latex, when compounded with sulphur, an accelerator, and activator like zinc oxide, may undergo changes even at room temperature and after a time may show incipient vulcanization.

If these samples infringed either of the Schidrowitz patents, it must have been the second patent, since no heat was applied by the defendants nor any other vulcanizing steps taken before shipment. Therefore, upon this record, any vulcanizing that occurred must have been due to the age of the mixture or the temperature to which it may have been subjected in transit, and not to any intentional act of the defendants.

The District Court held that claims 8, 9, 19, and 20 of the second Schidrowitz patent were not valid, as the same process was covered by the claims of the first patent, and that the mixing with latex, sulphur, zinc oxide and certain "ultra accelerators" or "low temperature accelerators," such as piperidine or a derivative thereof, known in the art as "pip-pip," was in common use in the prior art upon milled crude rubber, and it did not disclose invention to apply the same process to latex. . . .

The art of vulcanizing rubber is not a mechanical process, the result of which can be determined within a definite degree of certainty, but is an empirical process. It could only be reached by experiment. The chemical changes in rubber when vulcanized, or the action of sulphur when combined with it, are not understood. If the application of what is known as "hot vulcanization" in the case of crude rubber when applied to latex results in the vulcanization of the particles of rubber in suspension in the watery latex after the application of heat, it does not neces-

sarily follow that a compound of latex with zinc oxide and a "low temperature" accelerator without the application of heat or pressure would result in the vulcanization of the rubber particles in suspension in the liquid latex. We think that the discovery of this by Dr. Schidrowitz by experimentation was a step in advance over the prior art, and also of the so-called "hot vulcanization" discovered by Schidrowitz as applied to latex, and disclosed in the first patent in issue, and that the second patent was valid.

The vulcanization of crude rubber by the hot and cold method had been in use for nearly seventy years and no one before Schidrowitz had discovered that substantially the same processes, with some modifications, could be applied to latex before coagulation. This may in part have been due to the inability in this country readily to obtain a supply of latex for experimentation. At least, many of the authorities on vulcanization of rubber give credit to Schidrowitz for making the discoveries set forth in the two patents in suit. . . .

As already pointed out, there was clearly no infringement of the first Schidrowitz patent. The samples were at no time subjected to heat or pressure before leaving the defendants' plant.

Apparently the cases hinge on the proper definition of vulcanization as used commercially and in the art.

The defendants claim and support their contention by quoting from Dr. Schidrowitz's testimony in the record to the effect, as they claim, that commercially and in the art, vulcanization is a state produced in a particular compound, in which no further changes occur. In other words, while vulcanization is a progressive change in the character of the material, it is not until it is vulcanized as a finished product for a particular use, in which case no further change takes place, that commercially it is termed vulcanized. . . .

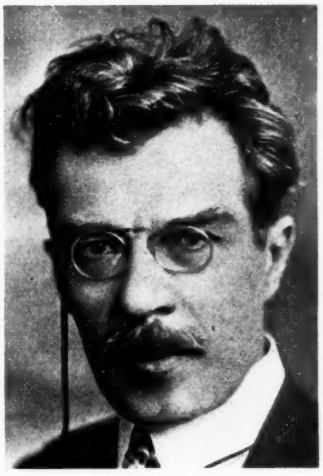
Evidently the defendants' samples were not vulcanized latex, nor do the defendants use any process that produces a vulcanized latex as that term is used commercially or in the art. An essential characteristic of a vulcanized product, commercially and in the art, whether crude rubber or rubber particles suspended in latex, is whether by the treatment they received they have acquired fixed and determined characteristics for a certain use which do not materially change with the lapse of time. . . .

While technically there was evidence of vulcanization to a certain degree, it was not evidence of a final and complete vulcanization such as would fix the characteristics of the sample for a particular use. To hold that there was infringement upon this testimony would give the plaintiffs a monopoly that the patent statute does not contemplate, since the use of such compounded mixtures by a customer who treated it to secure vulcanization to a degree suitable for his purpose, would be liable to a claim of infringement. It would be impossible to make up a compound that, before being used by a customer, might not show evidence of progressive vulcanization and subject either the seller or the buyer to a suit for infringement. This accidental incomplete vulcanization of a compounded latex is not covered by the patent which clearly contemplates a vulcanization which is complete although it may be light. The District Judge found, adopting the defendants' argument, that "defendant's product is not a vulcanized latex nor does defendant use any process which produces a vulcanized latex." . . .

We think the District Court erred in holding that the second patent in suit disclosed no invention over the first or over the prior art. The second patent being held valid but not infringed the decrees of the District Court should be affirmed.

The decrees of the District Court dismissing the bills are affirmed with costs.

OBITUARY



Dr. Ivan Ostromislensky

Ivan Ostromislensky

ANGINA PECTORIS brought death, on January 16, to the noted Russian scientist, Ivan Ivanovich Ostromislensky. Born in Moscow on September 8, 1880, he was graduated from the Second Military Academy (Cadet Corps of Katerine the Great) in Moscow in 1895. Then until 1899 he studied at Polytechnicum of Moscow, and after majoring in chemistry at the University of Zurich in Switzerland in 1902 he received his Ph.D. Four years later the university conferred an M.D. degree upon him. The next year he received the degree of Chem.E. from the Karlsruhe Polytechnicum in Germany.

From 1907 to 1912 Dr. Ostromislensky served as an assistant professor of chemistry in Polytechnicum of Moscow, Moscow University, and the School of Dentistry of Moscow. In 1911 he founded his own chemical and chemotherapeutical research laboratories where he engaged in the development of synthetic rubber. Besides he made many discoveries conducting research in chemical and pharmaceutical preparations. In 1917 he became a professor at the University of Nijny-Novgorod. From 1916 until he fled Russia in 1921 he was also Director of the Chemotherapeutical Division of the Moscow Scientific Institute. In 1921 he lectured at the Polytechnical Institute in Riga, Latvia.

At the request of the United States Rubber Co., New York, N. Y., Dr. Ostromislensky came to this country in 1921 to join the company's research staff. From 1922 to 1926 in its general laboratories he pursued his studies of synthetic rubber and a process of vulcanization of rubber without sulphur.

In 1922 he founded the Ostro Research Laboratories, Inc., 305 E. 63rd St., New York, for pharmaceutical research. Later he conducted research in the use of polymerized vinyl chlorides for the Eastman Kodak Co., and acted as consulting chemist. Besides, Dr. Ostromislensky published numerous experimental works and obtained many patents.

He was a member of the American Chemical Society, the Russian Medical Society, and the London Royal Society of Arts. His hobbies were literature and music.

Funeral services were held at the Russian Orthodox Church of Christ the Savior, New York, on January 20. He was cremated in Fresh Pond Crematorium, Mount Olivet Cemetery, Fresh Pond, Long Island.

Surviving are his widow, a daughter, and son.

James A. Donnelly

AFTER a lengthy illness James A. Donnelly, 50, long manager of wholesale sales of the footwear division, United States Rubber Co., Naugatuck, Conn., died on January 2 at Holy Name Hospital, Teaneck, N. J. He joined the company 32 years ago as a clerk in the footwear division, finally taking charge of jobbing activities.

His parents and a daughter survive him.

A requiem mass was said January 5 at St. Francis R. C. Church, Ridgefield Park, N. J. Burial was in Hackensack, N. J.

SAYS A RECENT ISSUE OF THE N.S.C. *Safe Worker:* "You can't earn a living in a hospital."

EASTERN AND SOUTHERN

EXPERTS believe the first quarter of 1939 will feature improved business conditions, but beyond that period they do not care to prophesy because of many uncertain factors pending. After a drop in industrial production in December from November's good showing, partly due to holidays and inventory taking, business picked up again in January and should continue for some time. In many quarters it is felt that the drastic reduction in retail inventories throughout the country is expected to cause sharp rises in manufacturing activity for at least the first half of 1939. The leather shoe industry has begun operations on spring footwear, and with the general outlook pointing to increased public purchasing power because of greater industrial activity the trade expects a normal season. Dealers of electrical appliances expressed the belief that sales for 1939 would average 40% higher than during 1938, and manufacturers count on a minimum rise of 25% in unit volume. Certain sections of the country recently witnessed the beginning of construction work on several large industrial plants; while old ones are expanding. After a drop in steel ingot production in December the output rose in January to about 53%. Steel makers, however, are disappointed at the relatively small volume of steel business placed since the new year began, but they expect real improvement early this month. By that time it is believed inventory data will have been digested and seasonal factors set in motion; and there is always the hope of something, now too long deferred, from the railroads.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., through President George H. Bucher recently announced, "in view of slightly improved business," partial restoration of pay reductions among salaried employes, all of whom last June received a 10% cut in the company's retrenchment move against declining business. Those earning $125 or less as of last May, about 5,000 salaried workers, or more than one-third of those affected by the June reduction, were restored to their former rates. Despite fluctuating business conditions the Westinghouse wage and salary plan, under which all employes have received extra pay each month but one for nearly three years, has continued to function.

Charles T. Wilson Co., Inc., 99 Wall St., New York, N. Y., announced that since January 3, Walter A. Graham, 815 South Hill St., Los Angeles, Calif., has been its crude rubber representative on the Pacific Coast. He formerly acted as buyer in the Far Eastern markets for the Firestone Tire & Rubber Co., Akron.

Greetings, Calendars, and Souvenirs

The staff of INDIA RUBBER WORLD gratefully acknowledges the following holiday mementos:

A midget RCA Victor radio from Godfrey L. Cabot, Inc., Boston, Mass.

Pocket memorandum books from John Royle & Sons, Paterson, N. J.

A leather wallet from Rare Metal Products Co., Belleville, N. J.

Attractive greeting cards from Bausch & Lomb Optical Co., Rochester, N. Y.; The Cleveland Liner & Mfg. Co., Cleveland, O.; C. A. Bartle, of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; Kenneth R. Elwell, La Grange, Ill.; H. W. Maxson and R. E. Powers, of The B. F. Goodrich Co., Akron, O.; G. F. Greeves-Carpenter, Yonkers, N. Y.; E. A. Hauser, of Massachusetts Institute of Technology, Cambridge, Mass.; Prosper E. Cholet and Jules Muehlstein, of H. Muehlstein & Co., Inc., 122 E. 42nd St., New York, N. Y.; Royce J. Noble, Malden, Mass.; J. R. Stricklen, of National Rubber Machinery Co., Akron; David C., James, and David C. Scott, Jr., of Henry L. Scott Co., 101 Blackstone St., Providence, R. I.; Bevis Longstreth, of Thiokol Corp., Trenton, N. J.; H. Walter Grote, of United Carbon Co., Charleston, W. Va.; Vansul, Inc., Englewood, N. J.; Vultex Chemical Co., Cambridge, Mass.; Techn. Rubberprod. Onderneming, Soesterberg, Holland; and Robert I. Wishnick, of Wishnick-Tumpeer, Inc., 295 Madison Ave., New York.

Useful calendars from Advanx Tyre & Rubber Co., Pty. Ltd., Sydney, N.S.W., Australia; General Atlas Carbon Co., 60 Wall St., New York; General Electric Co., Schenectady, N. Y.; Goodyear Tire & Rubber Co., Akron; Otto Krahn, Hamburg, Germany; Lavelle Rubber Co., 424 N. Wood St., Chicago; National Rubber Machinery Co.; Northwestern Rubber Co., Litherland, Liverpool, England; The Oak Rubber Co., Ravenna, O.; Sociedad Anonima Fabrica Argentina de Alpargatas, Patricios 1053, Buenos Aires, Argentina; and C. K. Williams & Co., Easton, Pa.

Lombard Squires recently resigned his position as research chemist for the Kaysam Corp. of America, Passaic, N. J. Effective February 1, he assumed new duties as a member of the Chemical Division of the Ammonia Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. After graduating from the University of Kentucky in 1929, Mr. Squires was instructor in the Chemical Engineering Department at Massachusetts Institute of Technology until November, 1935, when he joined the Kaysam research staff.

Rubber Reclaimers Association held a meeting and luncheon on January 17 at the Biltmore Hotel, New York, N. Y., when the following officers were: elected: president, A. J. Brandt, Philadelphia Rubber Works Co., Akron, O.; vice president, H. S. Royce, Boston Woven Hose & Rubber Co., Cambridge, Mass.; treasurer, John P. Coe, Naugatuck Chemical Division, United States Rubber Products, Inc., 1790 Broadway, New York; secretary, Mrs. M. B. Miller; directors, Mr. Brandt; V. H. Dingmon, Xylos Rubber Co., Akron; Clark W. Harrison, Bloomingdale Rubber Co., Chester, Pa.; E. H. Brooks, Goodyear Tire & Rubber Co., Akron; and Wm. Welch, Midwest Rubber Reclaiming Co., East St. Louis, Ill.

Vulcanized Rubber Co., Morrisville, Pa., operated during the past few months without any curtailment in working hours. The company and the United Rubber Workers of America signed a new agreement giving employes a more liberal vacation policy and some increases in minimum wages. The committee arranging the conference reported, "In these times of industrial turmoil it is good to see instances like this of relations so satisfactory that the company and its employes have passed through more than 50 years of peace."

Commodity Exchange, Inc., 81 Broad St., New York, N. Y., held a meeting of the board of governors on January 19 at which Charles Slaughter was elected president, succeeding Floyd Keeler, who was named a vice president to represent the rubber group, succeeding H. A. Astlett. M. A. Wehncke was reelected treasurer for a third term.

Foster Dee Snell, consulting chemist and engineer, 305 Washington St., Brooklyn, N. Y., addressed the Dayton Section, A.C.S., January 10, and the Toledo Section, January 11, on "Some Factors in Detergency," and the Alumni Chemical Society of Brooklyn College, January 25 on "Opportunities in Industry for Chemistry Graduates."

Anaconda Wire & Cable Co. has announced that Harry E. Thompson, formerly electrical engineer in charge of rubber insulation development and research at its Pawtucket plant, recently was transferred to the company's engineering headquarters at Hastings-on-Hudson, N. Y. Mr. Thompson was a member of the executive committee of both the Rhode Island Rubber Club and the Providence Section of the American Institute of Electrical Engineers and is a committee member in the American Society for Testing Materials. His new connection will broaden the scope of his duties and responsibilities with the Anaconda company.

Phillips Studio

Arthur H. Nellen

Development Manager

Arthur H. Nellen, who was just elected chairman of the New York Group, Rubber Division, A.C.S., has been associated with the rubber industry, with only one interruption, a year in the Gas Defense Division, Chemical Warfare Service, U.S.A., since graduation in 1917 from Penn State as a Bachelor of Science. He started out with The Republic Rubber Co., Youngstown, O., and in 1919 and 1920 was compounder for Firestone Tire & Rubber Co. In 1921 he returned to the Republic company, first as compounder, then superintendent of the mill and calender departments, and later as technical superintendent.

Lee Tire & Rubber Co. took over The Republic Rubber Co. in 1923, and Mr. Nellen became chief chemist, and manager of development for Lee Tire & Rubber Co., Conshohocken, Pa., is 1924, the position he has today.

Mr. Nellen has written many interesting papers on rubber and tires and has taken out several patents, particularly concerning tires. While at college Mr. Nellen was a member of Alpha Gamma Rho and Phi Kappa Phi, an honorary fraternity, and since then has become associated with the American Society for Testing Materials, American Chemical Society, and the Franklin Institute.

Golf, motor boating, and playing bridge, and chess not at all seriously, are his interests after his family and work.

Mr. Nellen was born in New York, N. Y., on March 11, 1896, and now resides in Merion, Pa. He has a son, 14, and a daughter, 10.

Huge Ford Exhibit to Include Rubber Processing

The "Ford Cycle of Production" to be exhibited at the Ford Exposition at the New York World's Fair this year will contain 87 individual displays covering the most important processes in the conversion of 27 raw materials from the ground to finished car parts. The exhibit will be in the form of a huge turntable, 100 feet in diameter at the base and 30 feet high, with steps to give it a wedding-cake shape. Weighing 152 tons, the turntable was constructed of 36,000 board feet of lumber, 14,000 board feet of plywood, and 32 ribs of structural steel. It will float on a hidden pontoon in a circular moat containing 20,000 gallons of water, this being considered the most efficient means of achieving silent operation and minimum power requirements. Centered on a king pin, the turntable will be driven by a two h.p. motor at a maximum speed of six revolutions per hour. The wooden steps will be covered with white linoleum. There are 133,600 moving parts, electrically powered at a cost of less than 25¢ per hour, in the assembly.

Beginning at the lower step the progress of each raw material will be shown by striking models, most of them animated and with representations of human figures or animals to add interest to the scene. Most of the upper structures which depict processing machinery are constructed of wood or plastics. Lines of trains, trucks, ships, etc., will be indicated between displays, showing the major means of transportation for each material. Before starting construction of the final displays a ½-inch-to-the-foot scale model of the entire turntable with its 87 complete displays was made and studied. From sketches and drawings of this model the final displays were built and assembled.

Rubber is one of 27 raw materials included in the exhibit, three essential operations being covered by animated displays: tapping a rubber tree; milling rubber on a mill; and molding rubber in a watch-case tire-press. Entering this processing picture is the cotton line which shows picking and ginning operations prior to use for tire construction. A sulphur bin is also connected with the rubber processing exhibit.

U. S. Rubber Co.

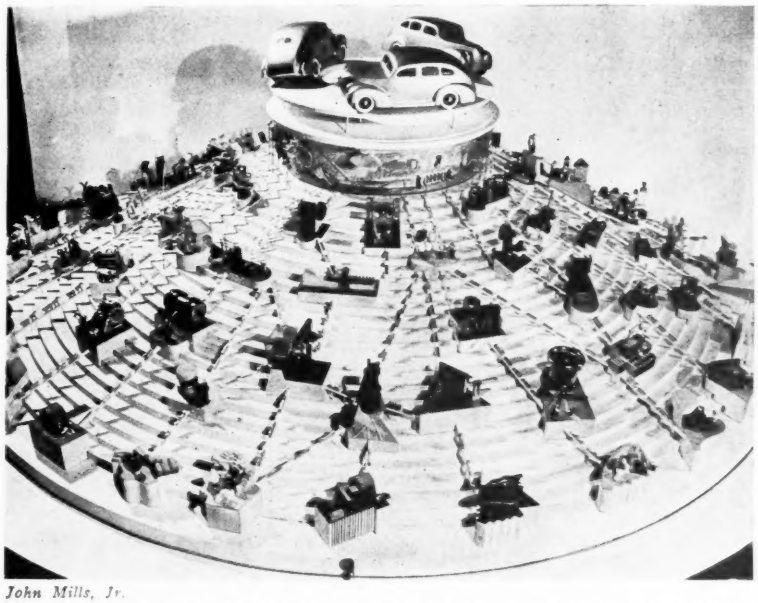
United States Rubber Co., 1790 Broadway, New York, N. Y., took advantage of the option in its indenture and redeemed $1,000,000 worth of its 4½% Sinking Fund bonds, issued on July 1, 1938, on December 31. This unexpected action anticipated by three years the first required due date for any sinking fund redemption of the company's first mortgage and collateral trust indenture bonds. At the same time U. S. Rubber paid off the $800,000 mortgage assumed when it purchased its office building at 1790 Broadway and also retired $342,000 in debenture bonds of a subsidiary company.

The calling of $1,000,000 in the first mortgage bonds reduced the consolidated funded indebtedness of the company and subsidiaries to $44,950,000, of which the company itself holds $950,000 in its own insurance and employe funds.

The company recently leased a portion of its plant at New Brunswick, N. J., to an industrial concern.

F. T. C. Charges U. S. Rubber with Tire Price Discrimination

In a complaint released by the Federal Trade Commission on January 9, 1939, the United States Rubber Co. and one of its subsidiaries, U. S. Tire Dealers Corp. are charged with violation of the Robinson-Patman Act in that they have engaged in unlawful price discrim-



John Mills, Jr.

Model of "The Ford Cycle of Production" Tire Molding Press Unit for Ford Exhibit

ination in connection with the sale of automotive vehicle tires.

It is alleged that the effect of the aforesaid practices is and has been substantially to lessen and injure competition in the distribution and sale of automobile tires between the respondents and other tire manufacturers, and between the special brand and other customers of respondents receiving the benefit of such price discrimination and other tire dealers paying a higher price for respondents' tires.

Twenty days are allowed for answering the complaint.

F. B. Davis, president and chairman of the board of directors of U. S. Rubber, on January 9 acknowledged the receipt of the complaint and stated that the company always had and would continually endeavor to conduct its business in accordance with the law and in the interest of the public, including the company's dealers, employes, and stockholders.

Mr. Davis said he "believes that when the company's merchandising policies are fully explained, the Commission's approval will be forthcoming."

New Division

Mr. Davis recently announced that on January 1, Emmet Sheahan, operations manager of U. S. Rubber's Detroit and Indianapolis plants, was appointed, besides, general manager of the new Automotive Division of the company. The operations of this division, with headquarters at Detroit, will include all the many products developed and sold by the rubber company in its various factories for use of automobile makers in the manufacture of cars.

Bristol Plant News

United States Rubber Products, Inc., is seeking a reduction in the valuation of its property at Bristol. Herman Goldman, of the corporation's legal department, appeared before the Town Council in support of the petition, but action awaits a decision from the corporation officials in New York upon a counter-proposal of the town officials. Records show that the Bristol tax assessors assessed $29,614 for the holdings of the United States Rubber Co. of New Jersey and United States Rubber Products, Inc., this year. This figure included taxes for factories, shops, and buildings on Wood St., land and pumping station on Thames St., and land on State St. Total valuation was set at $1,328,000, which included $725,500 for buildings and improvements, $74,500 for land, and $528,000 for tangible personal property. The nature of the counter proposition was not disclosed.

In an effort to secure the retention of the Providence, Warren & Bristol branch of the New York, New Haven & Hartford Railroad system, operating between Providence and Bristol, a hearing was held recently at Providence before the Rhode Island Public Utilities Commission. Although great stress was made as to the benefits of the branch road to the residential and business interests of the 14 miles traversed, the commission granted the road's petition for abandonment of the passenger service, but disallowed the discontinuance of the freight service and ordered its resumption as soon as possible. The road bed of the Bristol branch, badly wrecked by the hurricane and flood of September 21, has not been operated since. Among those who appeared at the hearing was George F. Hitchborn, general traffic manager, U. S. Rubber, who pointed out the importance to the corporation of the resumption of freight service. He said in part that the company's plant at Bristol, which employs about 1,200 persons when operated at peak capacity, might be forced to move to some other section if freight service is not restored. He explained that the concern manufactured in the Bristol plant insulated wire, a highly competitive commodity, and that it has a large investment in the Rhode Island plant.

Entertainment, distribution of gifts, and general dancing marked the sixth annual Christmas party of the Employes' Association of the Bristol plant of U. S. Rubber Products. More than 500 attended, including several plant officials.

Tire Distributers Meet

The 1939 Dealer Advisory Council of U. S. Tire Dealers Corp., at its first meeting, January 13 and 14, at the U. S. Rubber Detroit plant, discussed subjects of mutual interest and benefit to the nation-wide U. S. independent dealer organization, the company and the consumer. Also attending this gathering were the retiring 1938 members, several members of the original 1937 Council, company officials, and members of the general office sales and advertising staff.

The Dealer Advisory Council for 1939 consists of the following representative independent dealers: Marion E. Thackston, of Thackston Bros. Tire Co., Huntington, W. Va.; Charles S. Schwegman, president, Harrison Tire & Rubber Co., Cincinnati, O.; A. P. Woehrle, president, Beverly Rubber Co., St. Louis, Mo.; J. E. Richardson, Tyler Service Station, Tyler, Tex.; George Erwin, Winston-Salem, N. C.; Irving Greenberg, City Tire Co., Springfield, Mass.; Hugh J. Ahearn, of the J. W. Cassidy Tire & Auto Supply Co., Chicago, Ill.; Ed Owen, Standard Tire Co., Cedar Rapids, Iowa; Roger S. Marshall, Santa Monica, Calif.; and Ted Shoup, Klamath Falls, Oreg. They received the proposed 1939 advertising and sales promotion program and in a resolution adopted at the close of the meeting "wholeheartedly endorsed the program."

Another feature of the meeting was a general review of tire design, manufacture and testing as conducted by U. S. tire engineers, given by Dr. Sidney M. Cadwell, director of tire development, U. S. Rubber.

Representing the company from the New York headquarters were L. D. Tompkins, vice president, U. S. Tire Dealers Corp.; H. N. Hawkes, general sales manager; H. A. Farr, assistant general sales manager; J. C. Ray, manager, branch sales; C. A. Ostrom, manager, sales operating department; R. W. Collings, manager, automobile tire department; J. S. Shields, manager, farm tire department; R. L. Whisler, manager, truck tire department; F. M. Stewart, manager, advertising and sales promotion department. Also present were J. B. Brady, San Franicsco, general manager, Pacific Coast division, and the following divisional managers: C. M. Baker, Atlanta; C. J. Pike, Boston; H. C. McDermott, Chicago; T. E. Berry, Dallas; H. O. Bock, Detroit; D. W. Walsh, Kansas City; C. W. Ort, Los Angeles; A. B. Fennell, New York; J. D. Ferris, Portland, Oreg.; and M. N. Brady, St. Louis.

Announcement that U. S. Tire Dealers Corp. has sold its last remaining company-owned store, fulfilling a policy adopted at the time the U. S. Tire Dealers Mutual Corp. was formed, and that its retail replacement tire business now follows a policy of distribution through independent dealers, featured the rubber company's annual sales conference held recently at its Detroit plant.

Mr. Davis, who addressed the annual conference of district and divisional sales managers of the U. S. Tire Dealers Corp., in Detroit, Mich., on January 11, stated the outlook for 1939 was most promising; he further declared that United States tire dealers throughout the nation could look forward to a most satisfactory and profitable year for he believes that automobile tire replacement sales in 1939 would exceed the high rate established in the latter part of 1938.

Packings Executive

W. A. Tipton, manager, Packing Sales, Mechanical Goods Division, United States Rubber Products, Inc., at a recent meeting of the board of the Mechanical Packing Association, 17 John St., New York, was appointed a director of the association's rubber division.

Chlorinated Rubber Finishes

(*Continued from page 52*)

exposure to Florida salt atmosphere and tropical sunlight. As an indication of their flexibility and adhesion to metal, sheet metal coated two years prior to testing may be bent double without cracking the finish. Flat metal sheet coated with Roxaprene may be stamped, drawn, and knurled to form bottle or jar caps without breaking or scratching the film. In addition to use on metal, these coatings may be used on wood, asbestos, cement board, and many other materials.

OHIO

OHIO expects 1939 to be a good year. Dealers' stocks are low; and should business men decide to expand or modernize their plants, much profitable activity will result therefrom. Automotive parts makers have been enjoying good business owing to the spurt of automobile output and hope it will continue. Tire manufacturers also are enthusiastic about this year's prospects.

Goodyear News

The Goodyear Tire & Rubber Co., Akron, recently delivered to the United States Navy, K-2, said to be the largest non-rigid dirigible in the world. Built by Goodyear-Zeppelin Corp., the giant ship is 232 feet long, 76.5 in diameter, and has a volume of 404,000 cubic feet. The cabin has a capacity of eight passengers. Sleeping quarters are provided with Airfoam chair cushions utilized at night for mattresses, marking the first time this material has been used in lighter-than-air construction.

Forecast for 1939

President Paul W. Litchfield, in a year-end statement regarding the rubber industry, stated:

"After a low rate of production in the early months of 1938, as a result of the inventory situation and curtailment in the motor industry, tire manufacturing has picked up substantially and enters the new year with prospects more favorable than in some time. Total tire production in 1938 is now estimated at 40,000,000 units. This reflects primarily a decline in sales of tires to automobile manufacturers from 23,150,000 in 1937 to 11,300,000 in 1938. Replacement sales have held up well, especially in recent months, and probably exceeded the 1937 total, which was 29,700,000 units. Tire inventories in the hands of manufacturers have been reduced from 10,768,090 at the end of 1937 to about 8,500,000 at the present time. They are now probably below a normal level, when account is taken of the increased number of types and sizes of tires that must be carried in stock to meet current needs.

"In view of the high rate at which automobile assemblies are proceeding and the large demand for tires for replacement purposes that is expected from those who purchased new cars in 1935, 1936, and 1937, as well as from the owners of older motor vehicles, tire production and sales should continue at a favorable level for some months to come."

"Homecoming Week" Celebration

Goodyear has planned important conferences at Akron this month. The Inter-Plant Conference, to be attended by about 70 factory heads of outlying company plants, including production, engineering, development, etc., men, is scheduled for the week of February 12. These executives will stay over for the sales conference and Homecoming, which will start on February 19. The sales conference and Homecoming celebration should attract 1,800, including Goodyear salesmen, district managers, and principal store managers. Various groups figure in the Homecoming: sales and manufacturing, export and domestic.

The climax of the Homecoming will be the formal dedication of a bronze statue of Charles Goodyear on February 23, presented by the company to the city of Akron in observance of the one-hundredth anniversary of the discovery of vulcanization.

Faultless Building Tribute to Frank Miller

T. W. Miller, Jr., vice president, The Faultless Rubber Co., manufacturer of rubber sundries and specialties, Ashland, recently announced that the new Frank Miller Memorial Building, erected by Mr. Miller, his brother, and a sister in memory of their brother Frank, is a large brick recreation center with separate facilities for men and women employes of the company. Included are a large kitchen for preparing refreshments for parties frequently held, lounge rooms, ping pong and pool tables, radios, victrolas, reading racks, bowling alleys, locker rooms with showers and dressing tables. As a person enters the building, he sees a large painting, in color, of Frank Myers Miller beside his airplane, taken a few days before he lost his life last spring in a fatal crash accompanied by Robert Riley, his friend and foreman of the Faultless compound rooms. The late Mr. Miller joined the company on December 1, 1937, going into the compound room and being largely responsible for the handling of crude rubber. He had previously been with Meyer & Brown Corp., a New York brokerage house, where he learned about the commodity by working on the rubber docks handling, inspecting, and reporting on types of shipments received by the corporation.

Seiberling Rubber Co., Akron, according to President J. P. Seiberling, in 1938 enjoyed its most profitable year since 1931. He considers the outlook for the company's business in 1939 most encouraging with respect to increased sales volume. Seiberling sells its tire and tube products only through independent dealers and last year added 576 dealers to its list. Officers of the company follow: F. A. Seiberling, chairman of the board; J. P. Seiberling, president; W. A. M. Vaughan, executive vice president; J. L. Cochrun, vice president in charge of sales; H. P. Schrank, vice president in charge of production; C. W. Seiberling, vice president and treasurer; W. E. Palmer, secretary and assistant treasurer; C. E. Jones, comptroller; H. E. Thomas, assistant secretary; A. C. Blinn, C. W. Enyart, Robert Guinther, E. J. Smail, Jr., Messrs. Schrank and Vaughan, and F. A., C. W., and J. P. Seiberling, directors.

J. P. Seiberling on January 12 addressed the Orrville, O., Rotary and Exchange clubs on "The Romance of Rubber," tracing its history since the discovery of America to the present day.

General Tire News

William O'Neil, president, and L. A. McQueen, sales manager, of the General Tire & Rubber Co., Akron, head a group of sales and factory officials conducting a series of conferences in various key cities throughout the United States. Each of these conferences is being attended by from 400 to 600 General Tire dealers and their salesmen. Two-day sessions are being held in each of fifteen of the largest cities in the country, with a banquet closing the first day's activities. The conference schedule opened in November and will continue until March. Emphasis is being concentrated on General's newly expanded truck tire line and on the Dual 10 and 8 passenger car tires.

O'Neil Discusses "The American Way"

As a result of observing European industrial conditions during an extended trip last year, Mr. O'Neil has summarized his conclusions in a pamphlet entitled, "Let's Stick to the American Way!"

Some excerpts, as given here, are worthy of serious consideration when determining future American policies.

"As long as America sticks to the American way of doing things, it will have every reason to be the happiest country in the world. . . .

"We are not happy enough in America. The troubles that we have, as a nation,, seem a lot worse to us than they really are. We have not become used to adversity as have the people of many of the countries of Europe.

"If more of us could see, at firsthand, the conditions that exist in many parts of Europe, we would be very much better satisfied with our lot.

"Young men in America have an opportunity to rise to higher economic levels and to more important and responsible jobs, which is denied them nearly everywhere in Europe. . . .

"In the United States, workmen, on the average, are bigger capitalists than are many of the capitalists themselves, in countries of Europe.

"Laboring people are extremely class-conscious in Europe. If a man is a tire-builder, his son and his grandson are

pretty sure to be tire-builders. If he should want to go into a different job than that handed down from generation to generation, members of his own class call him 'stuck up.' . . .

"American workers are adaptable; European workers are not. At least 60% of the jobs that exist in America today were not known five years ago. These new jobs have been made possible by the development of labor-saving machinery.

"Many of them are merchandising and distribution jobs, for it takes eight times as many persons to merchandise and sell an article as it does to make it, in the first place.

"The development of labor-saving machinery has helped, not hurt, the American worker. By lowering production costs, labor-saving machinery has been largely responsible for the increase of more than 500% in the past five years, in the production of mechanical rubber goods.

"Such machinery has not cut down the number of production hours for labor. More labor-hours are being expended in the rubber industry today than ever before. . . .

"The so-called 'share the work' idea hurts the poor man, not the rich man. It hurts the faithful worker, who should be earning enough to enable him to start building a house and purchase other comforts, the production of which would give employment to other persons.

"Instead, it takes away his happiness by cutting his yearly wage down to a point where he can afford to buy only the bare necessities of life.

"If the regular employes of any company were allowed to work a few extra hours a week during times of peak production, they could be assured of stability of employment at comfortable wages, in nearly every case.

"If, however, new workmen have to be added to the payroll when work is at the peak, in order to make more members for the unions, and if the work to be done, when production falls off, must be shared among both old and new workers, then none will earn enough in a year to be comfortable. . . .

"I came home from Europe, convinced that the most important thing for us to do, in America, is to learn our own particular jobs better. We must concentrate on better salesmanship, both at home and abroad. There are plenty of markets that haven't been touched yet."

Outlook for 1939

David M. Goodrich, chairman, B. F. Goodrich Co., Akron, believes the rubber industry has come into 1939 with high hopes for a good business year. If current estimates of 1939 automobile production—3,400,000 cars and trucks against 2,600,000 in 1938—are correct, 4,000,000 more original equipment tires will be sold this year. Indicative of the trend, it has been estimated that 60% of all farm tractors built last year had rubber tires, as compared with 14% in 1935. In the last few months an encouraging increase in replacement tire sales has been recorded, and this higher pace should carry well into 1939. Total tire shipments of some 48,000,000 casings in 1939 would therefore appear to be an attainable goal. Such a figure would represent a 16% gain over estimated shipments of 43,000,000 tires in 1938.

New markets have been opened for rubber in the tremendous transit industry where at the end of 1938 more than 800 street cars in the United States were equipped with rubber springs and "sandwich" rubber wheels. Scientific studies that have already resulted in the use of rubber in more than 32,000 different articles are setting the stage for the rubber industry's future. With new and important products being developed, the rubber industry is now standing on the threshold of the most significant period in its history.

Factory in Rumania

Rumanian interests acting in conjunction with the Rumanian government are now building a modern tire and tube factory at Baicoiu, near Bucharest, to be completed about April 1. This corporation will manufacture rubber goods to supply the needs of the country and will be known as the Banloc Mfg. Co., named for the royal estate of Princess Elizabeth.

All equipment for the plant has been purchased in the United States and for most part in the Akron area.

Goodrich was selected by Banloc as the source of technical information, and products of Goodrich quality will be produced. Goodrich, however, has no financial investment in the Rumanian venture.

Early Pneumatic Tire Salesman

William J. McKeown, first pneumatic tire salesman ever assigned to the Chicago district, received his 20-year service pin last month at a sales conference in Akron, according to A. C. Kelly, Goodrich Chicago district manager. Mr. McKeown joined Goodrich in 1910, the year pneumatic tires began to be accorded national acceptance for "horseless carriages" although the first pneumatics for a commercial vehicle were built by Goodrich in 1896 for Alexander Winton. The veteran Chicago tire salesman became a member of The Fred Allen Auto Supply Co., pioneer Chicago tire distributer in 1915 and rejoined Goodrich in January, 1919. His entire service with the Goodrich company has been in the Chicago district where he is now in charge of the company's aeronautic sales in addition to his other duties.

NEW JERSEY

THE majority of New Jersey rubber manufacturers report business is showing a little upward trend, causing them to believe that early spring will show a still further improvement. Some manufacturers have taken advantage of the year-end season to overhaul machinery and equipment.

Essex Rubber Co., Trenton, recently announced that business for 1938 was very satisfactory and that present volume is good. The company expects higher prices to prevail before long. L. M. Oakley, an executive of the company, returned from an extensive business trip through New England.

Luzerne Rubber Co., Trenton, finds the hard rubber situation unchanged.

John Exton Thropp, late president of Wm. R. Thropp & Sons, manufacturer of rubber machinery, Trenton, left $100,000 to his daughter, Elizabeth T. Burroughs, $10,000 to his son, William R. Thropp, and the residue of his estate and personal effects to his widow, Helen W. Thropp. Stock in the Thropp company is directed to be held in trust for his wife and son.

Puritan Rubber Co., Trenton, reports business normal after slowing up for inventory taking.

Nearpara Rubber Co., Trenton, is experiencing a better demand for reclaimed rubber. The company recently installed new equipment in anticipation of late winter orders.

Percy W. Limouze, receiver, Gibraltar Tire & Rubber Corp., West New York, N. J., recently filed his sixth and final account covering the periods from April 20, 1928, to December 14, 1938, in the Court of Chancery of New Jersey, which on January 9 approved the account and directed distribution of the balance in his hands. After payment of allowances, there will be a balance of about $5,000 for distribution among the bondholders whose claims aggregate in excess of $40,000.

Mercer Rubber Co., Hamilton Square, stated that there appears to be a steady market for mechanical goods with a little improvement in the demand.

Acme Rubber Mfg. Co., Trenton, finds business picking up with orders better for mechanical goods.

Pierce-Roberts Rubber Co., Trenton, continues to operate with two shifts on molded goods. President Harry W. Roberts sees the demand for druggists' sundries rather good for this time of the year.

THE BUREAU OF THE CENSUS preliminary report on the domestic rubber boot and shoe manufacturing industry shows 11 establishments for 1937, against 12 in 1935 and 13 in 1933; average wage earners: 18,139 in 1937; 17,246 in 1935. Wages paid increased 25.5% from 1935 to 1937, and cost of materials rose 31.5%; while the value of products gained only 20.3%.

NEW ENGLAND

BUSINESS and industrial leaders in New England anticipate a continuance of improved conditions evidenced in their part of the country the last four months of 1938. They are now operating approximately on a normal basis.

The upward trend of industrial conditions in Rhode Island continued from October 1 to January 1, according to the State Department of Labor and the Brown Research Bureau. The rubber manufacturing industry was among those making the most favorable showing. As compared with the same period of 1937, there was an encouraging improvement in both the number of employes and the amount of payrolls. Although the increase in employment for the month ending December 15 showed only 1.3% over the month ending November 19, it was particularly significant because it was the sixth consecutive month showing a gain in industrial employment in the state and the first month of 1938 with more industrial workers than in the corresponding month a year ago. One of the outstanding gains of December was in the rubber manufacturing industry, which showed an advance of 10.9% of employment over November and 11.6% as compared with December, 1937, and a 22.8% increase in wages. The returns from eight rubber manufacturing concerns in December, 1937, showed employment of 3,664. In November, 1938, the same concerns reported 3,685 employes and in December, 1938, 4,088. The December, 1938, payroll of these eight concerns aggregated $29,552, an increase of 0.6% over the preceding month and of 22.8% as compared with December, 1937.

Washburn Wire Co., Wilmington, Del., with a plant at Phillipsdale, East Providence, R. I., has filed notice with the Secretary of State that its legal representative in Rhode Island is John E. Hayward, of Phillipsdale. The Superior Court for Providence County has granted the petition of the Washburn company for the dissolution of the corporate existence of the Washburn Wire Co., of Rhode Island.

The Collyer Insulated Wire Co., Pawtucket, R. I., has filed a statement with the City Clerk of Providence that it owns the Providence Insulated Wire Co., 58 Waldo St., that city. A petition of the Collyer company, asking that the Providence concern be dissolved as a corporation, was granted by the Superior Court for Providence County.

Howard S. Almy, for the past ten years associated with the Collyer company as credit manager and assistant secretary, has been appointed to the Bureau of Police and Fire of Providence for three years.

Fisk Reports

Col. Charles E. Speaks, president, The Fisk Rubber Corp., Chicopee Falls, Mass., in a new year prediction, foresaw the tire industry's business surpassing both 1938 and 1937, the latter an exceptionally good year. He believes 1939 holds a promise of rising national income, increased production, and wider employment gains. Tire sales will increase because of the tremendous jump in automobile production, which far exceeded expectations, plus a steady increase in the nation's motoring mileage. Besides the popularity of the bicycle, Colonel Speaks thinks, will reach new heights, and it has already definitely returned to the field of big business.

The trend in tire construction is now streamlined, he pointed out, with emphasis on sleek shoulders and circumferential ribs with cross-sectional inserts to assure quieter, smoother running without sacrifice of tractive and gripping qualities.

Engineers are working on a lighter, tougher tire for travel on super-highways in 1950, he said. In 1939 they will bring still greater safety and longer life in tire performance.

Colonel Speaks also foresees for this year sharp reductions in motor deaths by conducting the life-saving campaign of 1938 to new heights. The safety improvements in the 1939 automobiles will play an important part in this reduction.

Increased efficiency of brakes makes possible taking full advantage of the new quick-stopping tires. Improvements are likewise being made in highway construction and lighting. Greater emphasis on pedestrian control has begun and will be featured this year. But most important of all, the public, now thoroughly aware of this vital problem of safety, is cooperating wholeheartedly, Colonel Speaks said.

Warning to Tire Repair Men

A warning to tire repair men against improper use of sectional air bags was issued recently by R. A. Gray, service manager of the Fisk Tire Co., who declared that when air bags are excessively inflated at high temperatures to make them fit oversized carcasses, the bags stretch and become less resilient, and normal life is greatly reduced. Thus a 6.00 by 16 bag used continually in a 6.50 by 16 tire will give perhaps only 10 or 12 vulcanizing jobs so that the dealer makes little or no profit on his investment. A complete range of bag sizes will necessitate a larger original outlay, but will result in much greater profits in the long run.

Factory in Sweden

Fisk recently announced that together with Swedish interests it acquired a rubber factory at Viskafors, Sweden, to be known as the Fisk Scandinavian Rubber Corp., which will manufacture automobile tires besides mechanical rubber goods which the factory has been making for some time. It is expected the plant will be in full operation for the spring selling season.

The Viskafors factory, a few kilometers from Gothenburg, the largest seaport in Sweden, will be equipped with modern tire machinery, to manufacture a complete line of Fisk tires under Fisk standards and patents. Daily production will be between 300 and 500 tires and tubes. The factory now employs about 400 workmen, and it is anticipated that when it gets under way it will have 500. The buildings cover 107,600 square feet, and the total area belonging to the plant is over 247 acres. The entire direction and operation of the factory will be under Fisk engineers and chemists.

Capt. Wilhelm Osterman, formerly Fisk branch manager, and then Swedish distributer of Fisk tires for more than twenty years, will be managing director of the company, and J. A. Peterson, of the engineering division of Fisk at Chicopee Falls, will be factory manager. A skeleton organization also will be sent to Sweden to instruct Swedish workers. E. H. Marsh, vice president, The Fisk Tire Export Co., and K. R. Vogel, secretary of the company, who recently returned from Sweden after concluding arrangements, report excellent prospects for this new venture.

General Insulating Wire Corp., upon the petition of the General Insulated Wire Co., 69 Gordon St., Providence, R. I., has been dissolved as a corporate unit by the Superior Court for Providence County. It was incorporated under the laws of Rhode Island in 1931. Ernest Sneider was president, and Milton Freedberg, treasurer.

Bristol Mfg. Co., Inc., announced through President Maurice C. Smith that it has leased two more rooms from the National India Rubber Co. plant at Bristol, to bring its total floor space to nearly 58,000 square feet. Bristol Mfg. Co. recently increased production and raised its personnel from 275 to approximately 300.

Antonio Richards has filed a statement at the City Clerk's office, Providence, R. I., that he is the owner of the Richards Rubber Co., 288 Valley St.

American Insulated Wire Corp., Providence, R. I. A Christmas party was held by about 250 employes in the Cinderella Ballroom. A lounge chair was presented to General Manager Ira Galkin. Superintendent Herman Galkin received an electric toasting set, and Assistant Superintendent Max Lustig, a pen and pencil set. Entertainment and dancing followed dinner.

(Continued on page 82)

MIDWEST

THOSE in the know anticipate further business improvement in the Midwest for the first half of 1939. Much, of course, depends upon the condition of the railroads.

The rubber industry continues its good showing. Thirty-four firms recently reported paying 18,367 wage earners $481,000, rises of 7 and 3.2%, respectively, over the previous month.

Last month automobile production increased, countering a nominal seasonal decline. Although assemblies during January were expected to hold to a steady level, schedules this month will depend upon sales volume. Recent unfavorable weather retarded new car sales; in consequence releases for February shipments of automobile parts were held up in some instances. Naturally any improvement, or the reverse, in the automobile industry will affect allied lines, notably steel, automobile parts, and tires.

The Executive Committee, Rubber Section, National Safety Council, met recently at the Detroit, Mich., plant of United States Rubber Co., 1790 Broadway, New York, N. Y., to discuss plans and procedure for 1939 of the various committees as well as to formulate a program for participation in the annual N. S. C. congress next fall. Present were M. A. Clark, manager, industrial and public relations, James Kennan, first-aid attendant, Dr. W. S. Ash, physician, and Ralph S. Farnum, supervisor of safety, all of the U. S. Rubber Detroit plant; J. T. Kidney, manager, service department, Dr. P. A. Davis, medical director, and H. A. Walker, supervisor of safety, all of Goodyear Tire & Rubber Co., Akron, O.; D. G. Welch, supervisor of safety, Hewitt Rubber Corp., Buffalo, N. Y.; E. W. Beck, supervisor of safety, U. S. Rubber, New York; R. M. Weimer, director, personnel and safety, The Dayton Rubber Mfg. Co., Dayton, O.; John J. Loge, manager, personnel and safety, The General Tire & Rubber Co., Akron; W. Dean Keefer, director, industrial division, N. S. C.; Chicago, Ill.; C. W. Ufford, director of safety, Ohio Rubber Co., Willoughby, O.; and R. A. Bullock, director, personnel and safety, Corduroy Rubber Co., Grand Rapids, Mich.

Diamond Braiding Mills, Chicago Heights, Ill., organized more than 40 years ago to make braided material, about 15 years ago went into the manufacture of electrical wire, which business has grown to the point where it became advisable to set it up as a separate organization, to be known as the Diamond Wire & Cable Co., with practically the same sales and production personnel. The firm operates its own copper drawing plant and rubber mills and manufactures electrical appliance cords and cables for the radio and electrical appliance field. The manufacture of the braided division products, as shoelaces, etc., will remain under the name Diamond Braiding Mills, Inc., as a separate concern.

Midwest Rubber Reclaiming Co., East St. Louis, Ill., through President William Welch has announced that G. K. Trimble, chief chemist for a decade, has been elected a vice president. Other officers remain the same: S. G. Luther, vice president and general manager; W. A. Hart, secretary-treasurer; Howard R. Painter, assistant secretary.

Monsanto Activities

Monsanto Chemical Co., St. Louis, Mo., through Vice President G. Lee Camp has announced that Victor E. Williams, manager, New York, N. Y., sales branch, has been named assistant general manager of sales, dividing his time between St. Louis and New York. His successor as branch manager in New York is A. T. Loeffler, assistant manager there, who in turn is succeeded by F. C. Renner, assistant general manager of sales, Merrimac Division, Boston, Mass.

Monsanto Surveys Its Ownership.

Who owns America's industries? What types of people invest the capital that provides industrial employment? What do they do for a living?

Frequent allegations that "Sixty Families" control the assets of this country prompted a recent survey of its ownership by Monsanto Chemical Co., a medium sized company with headquarters in St. Louis and operations in Missouri, Illinois, Alabama, Tennessee, Ohio, West Virginia, Massachusetts, Virginia, New Jersey, England, and Wales. This broad and detailed analysis by a probably representative organization enables its employes to know the truth about their company and disproves much of the false thinking about American business that has been propagandized in recent years.

Monsanto's 1,291,816 American shares are held by 10,170 stockholders as of the start of this survey a few months ago. Of these 3,890 are men, 3,714 are women and the remaining 2,566 are classified as follows: 316 joint owners such as husbands and wives or business partners; 1,601 estates or trusts; 34 investment trusts; 42 universities or colleges; 72 insurance companies; 121 hospitals and charitable or educational foundations; 192 brokers as individual stockholders or purchasers for clients; and 188 individuals or groups, impossible to classify. The researchers found that those who might be considered shareholders, once removed because of their financial interests in stockholding companies or groups included: over 25,000,000 holders of life insurance policies; more than 170,000 shareholders in investment trust groups; and additional students or recipients of below cost-service in hospitals or charitable institutions.

The survey shows that the men and women who own the company are the same type of people as those who are employed by the company, having similar backgrounds, hobbies, and desires. Monsanto stock owners in Cincinnati, where the company has no activities, include: a director of a large chain-grocery company and a bookkeeper in the same company, a director in a soap company and a chemist in the laboratory of that organization, a gentleman farmer and a vegetable commission man, a professor and a student in the same university, a society woman and a secretary in an office, a manufacturer of heavy machinery and an operator of a filling station.

The entire survey was published January 25 in *Monsanto Magazine,* a company publication distributed to employes and stockholders regularly for the last 18 years. According to James W. Irwin, assistant to the president, it is the hope of the Monsanto executives that these findings will encourage other companies to do likewise so that millions of industrial employes may have a true understanding of their employers.

Transparent Material for Plant Layout

Vue-Pak, a cellulose acetate transparent plastic material recently introduced by Monsanto for packaging and other applications, is used by Dr. S. Theo. Jonas, a Chicago dentist, in building up a picture sequence for teaching dentistry.

This sheet material, durable and inflammable and available in thicknesses from 5 to 25 thousandths of an inch, is suggested for planning factory or other layouts where it is desirable to show machine locations in congested areas, and also to be able to study certain groups. By entering certain units on one sheet and others on superimposed sheets it is then possible to look down at the mass and see the entire layout. Special printing inks have been developed by Monsanto's Merrimac Division at Boston, and it is said that the pages can be washed or cleaned frequently without impairing the legibility of text or illustrations.

EXPORTS OF PNEUMATIC AUTOMOBILE CASings from principal manufacturing countries totaled 3,069,000 units in the first eight months of 1938, 14.1% under the 3,574,000 units of the same period of 1937. Exports of pneumatic automobile casings in 1937 totaled 5,075,000 units, against 4,413,000 in 1936 and 4,495,000 in 1935. The highest year for tire exports by manufacturing countries was 1929 when 9,383,000 were exported. *Commerce Reports.*

Rubber Industry in Europe

GREAT BRITAIN

Rubber Displays

The British Rubber Publicity Association loses no opportunity of making propaganda for rubber and demonstrating the multiple uses of rubber. At the recent Dairy Show in London the association had a stand showing various types of tires, specimens of practically every make of milking machine now on sale in Great Britain, rubber cow-washing pads, plastic rubber materials for flooring cow-stalls, a special type of tasteless conveyer belt, pails and other utensils fitted with rubber rings, a new silent milk-bottle carrier, rubber sheet for poultry nest boxes, rubber aprons and gloves for use in dairy factories.

At the Brewers' Exhibition, at Islington, the association again had an exhibit, including a small completely equipped cocktail bar; flooring, counter, table tops, cushions for bar stools, seating, skirting and counter mats, all were of rubber. Various ways in which rubber is used to deaden noise were also demonstrated at this show, such as a silent gliding door rolling over a rubber channel in the floor. At this exhibition, too, Redfern's Rubber Works, Ltd., Hyde, featured window display models of molded rubber, which have the advantage over the usual plaster and papier maché models, that they are practically unbreakable. Besides rubber models of bunches of fruit, and legs for displaying silk hosiery, there were others representative of well-known trade-marks.

British Tire Reports

British Tire & Rubber Co., Ltd., for the year ended September 30, 1938, showed a net profit of £177,112, against £168,707 in the preceding business year, to which is added £39,134 brought forward (against £36,076). Total dividends of 8% plus a cash bonus of 2% were again distributed; the carry forward was £51,743.

In a speech the chairman, Sir Walrond Sinclair, touched on the decision of the International Rubber Regulation Committee to raise the quota by 5% on January 1, 1939. This, he pointed out, was considered a premature move by many, but if optimistic reports from America were indeed justified and consumption there increased substantially, then the action of the I.R.R.C. would turn out to have been a prudent measure to forestall an unduly sharp upward swing of prices which, once started, might prove difficult to check.

The task of rebuilding and reequipping the Silvertown Works of the India Rubber Gutta Percha & Telegraph Works Co., Ltd., the chief subsidiary of the British Tire company, was completed last April, Sir Walrond further stated; these operations involved a certain amount of disorganization in working and consequent increased costs which are reflected in lower profits for this company; but it is now getting into its stride again, and progress is said to be satisfactory.

The British Tire & Rubber Co., which for many years has had close manufacturing relations with the sporting goods manufacturer, A. G. Spalding & Bros. (British), Ltd., has now taken over the whole share capital of this concern, including the South African company, and has also acquired a controlling interest in Spalding's firmly established and well-managed Australian business. In addition a controlling interest was acquired last year in a newly-erected rubber factory in South Africa which specializes in certain types of rubber hose, etc. This plant will enable British Tire & Rubber to service more effectively important local interests already established throughout the Union of South Africa and to take advantage of whatever further opportunities for expansion there may arise in that important market.

Avon's Profitable Year

Record sales both at home and abroad are reported by the Avon India Rubber Co., Melksham. Net profits, which increased from £57,803 to £62,024, were the best in 19 years, the chairman stated, and results for the first two months of the current business year show further gains. Compared with 10 years ago, the concern's consumption of rubber has become 300% higher, and 50% more workers are employed. Almost £500,000 have been spent in the interim to enlarge and modernize the works.

Successful Venture

Not so long ago R. W. Stewart & Co., Ltd., Dunfermline, found its production of rubber footwear seriously hampered as a result of strong competition from cheap Japanese goods; consequently there was much unemployment among the town's rubber workers. Then, to keep the factory working full time and give people steady employment, the company decided to experiment with the production of an overboot for women. This venture proved so successful that the number of employes had to be increased, and still more will be required in the near future. At present the firm caters only to the home market, but it is hoped soon also to enter markets abroad.

Revised Patent Decision

In May, 1937, International Latex Processes, Ltd., St. Peter's Port, Guernsey, applied for revocation of three patents granted to Thomas Lewis Shepherd, of Park Lane, London, W., in 1934, for an invention relating to improvements in the production of threads from latex, on the grounds of prior publication and that the nature of the invention and the manner in which it was to be performed were not sufficiently described in the complete specification. The Comptroller General of Patents upheld these contentions and revoked the patents. Mr. Shepherd appealed from the decision and last December the order of revocation was rescinded by Justice Simonds in the Chancery Divison. He held that there was no such prior publication or prior claim as to justify revocation of the patents. On the basis of the evidence he came to the conclusion also that the process was sufficiently and fairly described in the specification and that any competent person skilled in the art of reading the specification would understand the invention and be able to carry it into effect.

FRANCE

The crude rubber importing firm Alcan & Cie., 87 Rue Saint-Lazar, Paris, has been reorganized and is now to be known as the S.A. Française pour l'Importation du Caoutchouc (S.A.F.I.C.). The capital has been reduced to 8,000,000 francs. The directors include Maurice Alcan, president; Etienne Cremieu-Alcan, Harry Levis, and Andre Steinberg-Terquem. Robert Ostier retains his powers as before.

ESTHONIA

The Esthonian Minister of Economics recently decided to permit the erection of two rubber factories. The first, at Pernau, will manufacture only rubber footwear at the start. The second factory will be built at Salutagu by a concern with a capital of 400,000 kr.

GERMANY

Softening Buna

Untreated Buna is much tougher than natural rubber, a circumstance which causes many difficulties in the various manufacturing operations, resulting in lowered output and a higher percentage of waste. Up to about one year ago it was attempted to obtain the necessary plasticity by mastication or by the addition of large amounts of softener. However prolonged milling was not merely expensive, but at best only partially effective; softeners improved the workability of the mixes, but at the expense of quality.

Latterly Harro Hagen[1] has investigated the possibilities of thermal or oxidative softening for Buna. This method seems promising, although besides advantages there are also disadvantages. Thus, treated Buna shows decreased elasticity; larger amounts of sulphur and accelerator have to be added (depending upon the amount of softening the Buna has undergone); and unless great care is observed in preparation, it is more easily susceptible to aging, heat, and fatigue.

Buna was softened by heating in the presence of oxygen, of air, under pressure, and also with the addition of certain catalyzers; the latter, by the way, have not yet appeared on the market. The treatment causes the plasticity of Buna to increase rapidly at first, but continued heating after a certain stage induces resinification or cyclization; the material becomes hard, brittle, translucent, and insoluble in organic solvents. The danger of cyclization increases with increased temperature.

Heating at a moderate temperature over a period of not less than 30 minutes appears to give the most satisfactory results. The addition of the catalyzers mentioned above hastens the softening process, thus permitting the temperature to be reduced.

The development of this process means a great step forward in solving the problem of successful Buna application, but as the writer points out, manufacturers who adopt it must exercise great care because it is so easy to select an unsuitable rate of softening and thus produce inferior products.

New Grinding Disks

Highly porous grinding disks, recently put on the market, are claimed to have several advantages over the usual type of silicon-carbide disks used, among other purposes, for finishing rubber rolls. The new M.S.O. disks, as they are called, have artificially enlarged pores and are therefore much lighter in weight than ordinary disks, to permit smoother, vibrationless working. The enlarged pores, it is further claimed, catch the particles ground off which are subsequently ejected by centrifugal force. In this way clogging is prevented; consequently rolls of all kinds of even the largest dimensions can be completely finished without the need of renewing the surface of the disk, and in a shorter time too. Another advantage of the open structure of the disk is said to be that in rotating it produces a cool current of air which effectually prevents overheating of the rolls. Furthermore, as a fine grain can be selected with this type of disk, highly satisfactory surfaces are obtainable.

[1] *Kautschuk*, Nov., 1938, pp. 203-10.

Notes

Reports from the Traiskirchen Works of the Semperit GummiWerke A.G., Vienna, state that since the middle of last March the number of employes has increased from 680 to 1,500 while output has increased about 150%. The existing factories at Traiskirchen have become too small; so additional new buildings are to be erected which will be many times the size of the old works. Other Semperit factories are also to be enlarged or altered to suit the new conditions. It appears also that tire production is to be increased.

The Engerau factory of the Matador Gummiwerke A.G. (of Prague), affiliated with the Semperit concern, is also working to capacity. It is possible that certain changes will be made here now that Engerau has become part of Germany.

C. G. Haubold A.G., Chemnitz, specializing in the construction of machinery for the rubber industry, reports net profits of 272,000 marks for the past business year against 303,000 marks for the preceding year. The company has a capital of 3,600,000 marks.

An inner tube for cycles that can be opened and closed over its entire length by means of a zipper fastener, has recently been patented here.

HOLLAND

The International Association for Rubber Cultivation in Netherlands India celebrated its twenty-fifth anniversary on December 6, 1938, at the Amstel Hotel, Amsterdam, Holland. Among those present were G. H. C. Hart, representing the Minister of Colonies; Prof. L. P. Cosquino de Bussy, director of the Commercial Museum of the Colonial Institute; A. G. W. Swart, founder and past chairman of the association; J. Luyten, acting chairman of the Ondernemersraad, for Netherlands India; Dr. A. van Rossem, director of the Research Division of the Rubber Foundation; J. L. Milne, chairman of the Rubber Growers' Association; P. Petithuguenin, vice president of the Union des Planteurs de Caoutchouc en Indochine; and Eric Miller, chairman of the International Rubber Research Board and the International Rubber Propaganda Committee.

At the reception the chairman of the association, Jhr. W. J. de Jonge, sketched the development of the rubber industry and the part played by the experiment stations. In 1913, he pointed out, world exports of rubber totaled 120,000,000 kilos; by 1937, almost 1,200,000,000 kilos; while potential output was probably higher by one-third; in 1913, more than 55% of the exports consisted of wild rubber, against about 2% today. In the years from 1913 to 1937 yield capacity increased from 700 to 3,000 half kilos per hectare, with certain experimental areas known to give 4,500 kilos per hectare. The price of rubber, still as high as 5s.9d. per pound in 1913, sank to 2 11/32d. in 1932.

With the rapid expansion of plantation rubber many problems of exploitation and preparation arose, and various experiment stations were founded to help producers cope with them. Besides, the participation of foreign capital as well as Netherlands capital in Netherlands India developed the need of a representative organization, and on the initiative of A. G. N. Swart and M. Sanders, a special meeting was held on December 6, 1913, when Netherlands, English, French, and Belgian interests decided to found the International Association for Rubber Cultivation in Netherlands India.

Referring to the form in which rubber appeared on the market, the speaker pointed to the great progress of latex, especially in the United States where it now constituted 4% of the rubber shipments to the country, which, considering that the main consumer of rubber, the tire industry, uses no latex, is a fairly large amount.

The chairman further showed that while the big tire manufacturing countries were still the main users of rubber, an increasing number of other countries was taking up the manufacture of rubber goods. In 1900, he said, barely 20 countries were consumers of rubber; whereas at present over 50 have a rubber manufacturing industry of their own, and the newcomers produce chiefly footwear and mechanical rubber goods.

The speaker further stated that the experiment stations were attempting to combat the threat of synthetic rubber by reduction in the price of rubber and by improving the properties of natural rubber.

At the conclusion of his address, Jhr. de Jonge announced that the association had decided to institute a gold medal to be awarded to those who have rendered exceptional service to the rubber cultivation industry and that the first medal was to go to J. F. de Beaufort, who for 25 years has been vice president of the association.

Rubber Industry in Far East

NETHERLAND INDIA

Tapping Stopped

According to the Central Bureau of Statistics at Batavia, Java, 544 estates with a total tappable area of 81,952 hectares had stopped all tapping at the end of October, 1938. In addition 454 estates had partly stopped tapping, the area involved accounting for a further 133,651 hectares, so that the total area untapped at the end of October, 1938, came to 215,603 hectares, or 40.8% of the tappable area in Netherland India.

Exports

Final statistics, also issued by the bureau, put the exports of crude rubber from estates in Java during October, 1938, at 4,618 tons, which included 59,605 kilos in the form of tires and 11,737 kilos of latex. Estates in the Outer Provinces at the same time shipped 7,879 tons of rubber, including 584,607 kilos of latex. Native shipments from the Outer Provinces were high, amounting to 17,924 tons. The total for Netherland India for the month, was 30,421 tons, dry weight.

November shipments substantially declined, especially in native rubber; the latter came to less than half the total for October. Preliminary figures are: estate exports from Java and Madura, 4,037 tons; estate rubber from the Outer Provinces, 6,914 tons; native rubber from the Outer Provinces, 8,546; total Netherland India, 19,497 tons.

Stocks of native rubber held by recognized exporters in the Outer Provinces totaled 12,899 tons November 30.

Leaves I.R.R.C.

Prof. J. van Gelderen, head of the Netherlands Delegation on the International Rubber Regulation Committee since 1934, resigned at the end of 1938. This resignation was to have taken place some time ago when Prof. van Gelderen was elected member of the Second Chamber of the Netherlands parliament, but he was requested to continue his valuable cooperation with the committee for some time longer, especially in view of negotiations under consideration at the time.

Mentioned as his successor is G. H. Hart, who has had considerable experience in Netherland India, having formerly directed the Landbouw Syndicaat, Java, and later acted as Director of Economic Affairs in Netherland India. At present he is head of the Eighth Division of the Colonial Ministry at The Hague.

At the World's Fair

The Netherlands are stinting neither time, effort, nor expense in preparing their stand at the World's Fair in New York this spring. Netherland India and its various products and native arts and crafts are to be well represented. Naturally the rubber industry will not be found lacking. The complex community that a large modern rubber estate really is will be demonstrated by means of small models showing such an estate complete with factories, quarters for staff and coolies, hospitals, sports grounds, transportation facilities, etc. Netherland India is also to be represented at the San Francisco Fair, and experts have already left the Far East for America to assist those in charge of the Netherlands stands with advice regarding the arrangement of the Eastern exhibits and to make propaganda for Netherland India products.

Preparing Native Rubber

About a year and a half ago the government gave financial and technical assistance in the erection of 12 native rubber factories for preparing rubber in the Leuwiliang district, near Buitenzorg, Java. These are now reported to be making excellent progress, and some have already completely paid off the government loans. Indeed when it became apparent that the factories were developing into profitable small concerns, the Volkscredietbank took over the loans so that the government is no longer financially interested in the matter; however, it still maintains technical supervision of the factories through the Department of Industry. These small factories are all under a single management and have one sales office, which makes for economy. They prepare a very good product and supply a considerable amount of it to the Goodyear factory at Buitenzorg.

INDO-CHINA

Export permits are temporarily required for various articles shipped from French Indo-China, except from Kouang-tcheou-wan. The articles include balata, gutta percha, crude rubber, latex, waste and old rubber.

Crude rubber exports amounted to 8,269,183 kilos in September, 1938, bringing the total since the beginning of the year to 41,688,575 kilos.

MALAYA

Against Higher Quotas

While some circles believe that improving conditions in America justify the increase of 5% in permissible exports for the first quarter of 1939, local opinion on the whole is adverse; it is felt that the I.R.R.C. has again made a mistake and that it had not the interests of producers at heart. It is pointed out that the higher percentage is uncalled for in view of the fact that under the provisions for the renewed restriction period the basic quotas are already raised considerably; the basic quotas for 1938, 1,335,250 tons, were increased to 1,519,000 tons for 1939. In some quarters it is held that the additional 5% in the quota at this time is a concession to America to insure the success of the Anglo-American trade pact.

Apropos of the trade pact, dissatisfaction is also expressed at the news that by the terms of the pact the ban on the exportation of *Hevea* planting material may be lifted in favor of America, thus permitting American rubber companies operating in Liberia and Brazil to obtain superior planting material to extend their plantations in those countries.

Bud-Grafting Doubts

The performances of bud-grafted areas is naturally a subject of perennial interest. Despite the fact that budding has now been adopted by a good many rubber producers in Malaya and that the budded acreage is being steadily expanded, a section of the planting community here is still skeptical about bud-grafts. Only recently, at the planters' conference, opposing views were expressed on the subject by a scientist and a planter, the latter definitely taking the stand against bud-grafts.

The English paper *Truth* publishes a letter on this subject by a Malayan planter. The writer says in part:

"The hypothesis of bud-grafting is good, but has it proved a success on a large scale? The last Prang Besar report seemed, reading between the lines, to admit that the past bud-grafting had been a failure, but hoped that the later bud-grafting would be a success. Owing to certain managers of plantations not being allowed to give away information, it is difficult to find out the actual facts about bud-grafting. Some managers do condemn it, because the trees 'burr' after tapping and thus become untappable.

"Will those companies who have bud-grafted or replanted with bud-grafted rubber be able to produce their 'assess-

ment' when control is removed? Because extra heavy assessment has been given for bud-grafted rubber by the Assessment Committee for 'restriction' purposes, it does not follow that the plantations in question can produce the rubber. It should be remembered that some leading companies are interested in the sale of 'budwood' and that company managers form the majority of the Assessment Committee, although only about 37% of the rubber in Malaya is London (company) owned, the rest being privately owned, including smallholders, of course. I believe the figures are 1,250,000 acres out of a total of 3,300,000 acres."

Rubber in 1938

The percentage of the total tappable area untapped on estates of 100 acres and over rose to 44.8% at the end of September, 1938. The estimated tappable acreage was 1,865,504 acres, and of this 835,603 acres were untapped. On small holdings the untapped area increased to a figure 455,200 acres, or 36%.

Reporting on conditions on smallholdings in the third quarter of 1938, the Economic Branch of the Department of Agriculture states that production for that period fell to 23,124 tons, bringing the total for the first nine months of 1938 to 93,619 tons, against 138,010 tons in the corresponding period of 1937. While small-holders are not generally inclined to improve their plantations and extensive areas are in a bad condition, the present position on the whole cannot be considered unsatisfactory. A certain amount of replanting has been done by Asiatics with budded material; but the total area is insignificant.

Under the International Rubber Regulation Scheme small-holders receive their rights for new planting in the form of share certificates, each share giving the right to plant 1/20-acre of rubber trees. Many small-holders did not quite understand the nature of these certificates and sold them almost as soon as they were received, in some cases for as little as 60 cents (Straits currency) per share. However smallholders in many sections are using their shares to increase their areas under rubber, and there has even been an increased demand for the shares by Malays, thus raising the prices of shares; so they are now selling at from 90 cents to $1.30 per share. In certain districts a large number of shares is said to have been acquired by the larger estates owning reserve land.

JAPAN

The first purchase of a rubber plantation by Japanese was made in 1912, but by 1933 total investments by Japanese business men in the rubber growing industry was put at 84,800,000 yen, or 2.8% of the world's total. Japanese at that time controlled 125,000 acres of rubber capable of producing 15,000 tons of rubber annually and employed 43,800 coolies, including families. Latest data available show that at present Japanese own 138,197 acres planted with rubber which have a total productive capacity of 49,100,000 pounds, or 355 pounds an acre. More than half the acreage is in British Malaya, that is 77,527 planted acres with productive capacity of 25,366,000 pounds annually. Besides there are 20,015 acres planted in Sumatra, annual yield, 7,979,000 pounds; 12,680 acres in Netherlands Borneo, yield, 3,682,000 pounds; 4,574 acres in Java, yield capacity, 1,695,000 pounds; 5,019 acres in Sarawak, yield, 1,400,000; British North Borneo, 13,580 acres, yield, 7,585,000 pounds; Rio Archipelago, 3,552 acres, yield, 573,000 pounds; and Siam, 1,250 acres, yield, 820,000 pounds. The highest output per acre, working out at 655 pounds per acre, is obtained in Siam, and the lowest, 161 pounds per acre, in Rio.

At present the distribution of carbon black as well as of crude rubber is controlled in Japan. The monthly consumption of carbon black by members of the Japanese Rubber Manufacturers' Association is about 1,000,000 pounds, but the total amount licensed by the government under the first, second, and third licenses amounted to about 980,000 pounds; while the fourth (soon to be issued) will probably involve about 500,000 pounds. This is not sufficient to meet manufacturers' demands, and the association intends to petition the government for permission to import about 1,000,000 pounds monthly to cover domestic needs.

AUSTRALIA

Statistics of Australia's rubber manufacturing industry during the three fiscal years ended June 30, 1935, 1936, and 1937, respectively, show a decline in the number of factories, the number of persons employed, and total salaries and wages paid. But in 1936-37 the value of power and materials and of output increased substantially. In that year there were 289 rubber factories employing 6,455 persons, receiving $4,693,608 in wages and salaries. Power and materials used represented a value of $17,004,001, and output, a value of $26,064,671. The materials used included 33,371,985 pounds of raw rubber, 3,203,299 pounds of reclaim, 319,433 pounds of bought scrap, and 1,987,379 pounds of latex and other rubber. The chief products are tires, tubes, and footwear. In the year under consideration the output included 1,205,871 tires for motor vehicles, value $11,904,493, and 1,926,842 tubes for automobiles and cycles, value $1,933,420. Footwear production included wading boots, knee boots and galoshes besides other rubber boots and shoes. Data are incomplete, but available figures show a total output for the year of 3,609,978 pairs, value $1,995,251. Among the other products may be mentioned: 8,976,774 feet of garden hose, value, $634,263; tubing, 2,280,230 feet, value $49,635; floor covering, 135,873 square yards, value $331,440; hot water bottles, 349,809 units, value $125,004; sheeting, 208,214 square yards, value $71,396; rubber sponges 675,625 pounds, value $324,005; floor mats, value, $100,423, and rubber soling material, value, $216,394.

POLAND

Following the Russian example, Poland is now also endeavoring to grow rubber-bearing plants. A large number of plants have been tested, but it appears that comparatively few are able to withstand the rigors of the Polish climate. Among those that have failed is *Parthenium argentatum,* from which guayule rubber is obtained in Mexico. However experiments by the Scientific Agricultural Institute of Pulawy have yielded encouraging results for *Taraxacum Kok-Saghyz,* which plant is also among the most promising in Russia. In Poland some samples yielded 9% rubber, but the rubber content is said to vary considerably with individual plants. Varieties of *Solidago,* experiments with which were first undertaken in America by Edison, can be cultivated in Poland also; indeed a few kinds grow wild here. *Solidago Leavenworthi,* which has been found to yield up to 12% in America, is also to be tested here. Another plant that has been studied in America and is receiving consideration here is *Asclepias.* The most suitable variety for Poland seems to be *Asclepias syriaca L.,* but at the Pulawy Institute it was found that this variety yields only about 2.15% of rubber. But work is continuing in this direction.

ARGENTINA

While Argentina imports of crude rubber in the first half of 1938 came to 3,399,931 kilos, against 3,585,960 kilos in the first half of 1937 and 9,700,199 kilos for all of 1937, imports for July, 1938, were 1,002,739 kilos, and it is believed that rubber consumption for the whole of 1938 will show a higher figure than for the preceding year.

Increased consumpton of crude rubber here has been influenced by the recent introduction of the manufacture of rubber belting. A local branch of an American firm has installed a 300-ton vulcanizing press for the production of belting for transporting materials, for elevators, harvesters, agricultural machinery, etc. It is expected that local production will mean lower prices for these articles while at the same time it will provide added opportunity for Argentine labor as well as a new outlet for Argentine cotton.

Patents and Trade Marks

MACHINERY

United States

20,977. (Reissue). **Rubber Thread Apparatus.** K. R. Shaw, assignor to Easthampton Rubber Thread Co., both of Easthampton, Mass.

2,141,405. **Rubber Strip Making Device.** C. J. Randall, Naugatuck, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,141,630. **Tube Coating Machine.** C. J. Westin, assignor to F. J. Stokes Machine Co., both of Philadelphia, Pa.

2,141,913. **Sheet Stretcher.** F. Honig, Pawtucket, R. I., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,142,025. **Loom.** W. H. Hall, Jr., assignor, by mesne assignments, to Thermoid Co., both of Trenton, N. J.

2,142,223. **Inner Tube Apparatus.** C. A. Tout, Butte, Mont.

2,142,281. **Vulcanizer.** N. Német, Pestujhely, assignor of 55% to H. de Csarada and 45% to B. V. Vertel, both of Budapest, Hungary.

2,142,581. **Press.** E. M. Winegar, Willoughby, assignor to Ohio Rubber Co., Cleveland, both in O.

2,143,507. **Perforating Machine.** F. J. Chandler, assignor to Perfotex Co., both of Toledo, O.

2,143,627. **Vulcanizer.** T. M. Knowland, Belmont, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.

Dominion of Canada

378,412. **Fastener Securing Machine.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of United States Rubber Products, Inc., New York, N. Y., assignee of C. Anderson, now deceased, in his lifetime of Waterbury, Conn., G. B. Baehr and G. M. Gay, both of Waterbury, and C. T. Manville, Woodbury, Conn., all in the U. S. A.

United Kingdom

491,970. **Tire Mold.** Firestone Tire & Rubber Co., Ltd.

491,987. **Vulcanizer.** H. DeCsarada and B. Vrtyel.

492,260. **Tire Retreader,** J. W. Llewellen.

492,566. **Vulcanizing Mold.** Hungarian Rubber Goods Factory, Ltd.

492,679. **Vulcanizing Press.** C. Macbeth.

492,703. **Thread Tension Equalizer.** Consolidated Rubber Manufacturers, Ltd.

Germany

668,662. **Hose Tester.** H. K. Weihe, Chemnitz.

668,852. **Tire Pressure Indicator.** G. Woelcke and F. Staffhorst, Hannover.

668,986. **Device and Method to Make Rubber Thread.** Soc. Internationale de Participations Industrielles & Commerciales S.A., Luxemburg. Represented by F. Warschauer, Berlin.

669,548. **Sheet Rubber Crimper.** K. Kozell, Vienna.

PROCESS

United States

2,140,672. **Sealed Connection.** R. B. Gray, Dundalk, and H. M. Shealey, assignors to G. L. Martin Co., both of Baltimore, Md.

2,140,692. **Molding Rubber Articles.** C. L. Daly, Belmont, assignor to Daly Bros. Shoe Co., Inc., Boston, Mass.

2,140,696. **Elastic Fabric.** A. Ferrari, Saint-Victor-sur-Rhins, France.

2,141,708. **Laying Wood Flooring.** A. Elmendorf, Winnetka, Ill.

2,141,788. **Rubber Article.** V. H. Hurt, Naugatuck, Conn., assignor to United States Rubber Co., New York, N. Y.

2,142,242. **Tread Member with Friction Insert.** A. Greenbaum, Beachmont, assignor to Panther-Panco Rubber Co., Inc., Chelsea, both in Mass.

2,142,292. **Artificial Leather.** S. J. B. Ten Cate, Kootwijk, Netherlands.

2,142,971 and 2,142,972. **Curing Endless Belting.** J. M. Bierer, Newton, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.

2,143,600. **Tape.** F. W. Humphner, Oak Park, Ill., assignor, by mesne assignments, to Mid-State Gummed Paper Co., a corporation of Del.

2,143,694. **Casing.** J. M. T. Hauvette, assignor to Michelin et Cie, both of Clermont-Ferrand, France.

Dominion of Canada

378,222. **Chlorinated Rubber Product.** Canadian Industries, Ltd., Montreal, P. Q., assignee of C. R. Barsby, Wembley, England.

378,322. **Paper Tie-Band.** R. H. Wilbur, Melrose, assignee of J. D. Lane, Boston, both in Mass., U. S. A.

378,576. **Tape.** Van Cleef Bros. (a partnership consisting of N., F., and P. Van Cleef), assignee of Van Cleef Bros. (a partnership consisting of N., F., M., and P. Van Cleef), assignee of P. Van Cleef, all of Chicago, Ill., U. S. A.

378,655. **Water Purification.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Gibbons, Montclair, N. J., U. S. A.

United Kingdom

491,665. **Ball.** M. B. Reach.

492,030. **Rubber Dispersion Electrophonetic Treatment.** Semperit Oesterreichisch - Amerikanische Gummiwerke A.G.

492,097. **Suspenders, Garters, Etc.** W. H. G. Adams and W. J. Adams & Co., Ltd.

492,439. **Rubber Thread.** T. L. Shepherd.

492,631. **Elastic Warp Fabric.** P. Schonfeld.

492,840. **Wheels.** Dunlop Rubber Co., Ltd., and C. E. Goodyear.

493,073. **Rubber Sheets.** Expanded Rubber Co., Ltd. (Rubatex Products, Inc.)

493,579. **Elastic Thread.** International Latex Processes, Ltd., and R. G. James.

494,061. **Printing Surface.** G. Glockemeier and A. Zecha.

Germany

668,600. **Gas Masks.** Continental Gummi-Werke, A.G., Hannover.

668,702. **Crimping Rubber Sheet.** United States Rubber Co., New York, N. Y., U. S. A. Represented by H. Scheidegger, Berlin.

668,805. **Floor Covering.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

668,980. **Sponge Rubber Foot Aids.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

669,038. **Lining Metal Objects with Rubber.** National Standard Co., Niles, Mich., U. S. A. Represented by L. Hirmer, Berlin.

669,602. **Producing Rubber Thread.** International Latex Processes Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

669,681. **Rubber Thread.** H. Schuller, E. Matzner, and A. Kailich, all of Vienna.

669,682. **Rubber Objects.** K. Leseberg, Vienna.

CHEMICAL

United States

2,140,506. **Stencil Composition.** C. V. Canning, assignor to Sweets Laboratories, Inc., both of New York, N. Y.

2,140,527. **Rubber-Shellac Composition.** C. R. Haynes, Clinton, Conn., W. R. Clayton, New York, N. Y., and R. V. Townend, Arlington, N. J., assignors to W. Zinsser & Co., New York.

2,140,715. **Chlorinated Rubber.** J. M. Peterson, Kennett Square, Pa., assignor to Hercules Powder Co., Wilmington, Del.

2,140,835. **Chlorinated Rubber and Wax Composition.** E. Gebauer-Fuelnegg, Evanston, Ill., and E. W. Moffett, Gary, Ind., assignors, by mesne assignments, to Marbo Patents, Inc., a corporation of Del.

2,140,868. **Plasticized Rubber Hydrochloride.** H. A. Winkelmann, assignor to Marbon Corp., both of Chicago, Ill.

2,142,144. **Organic Sulphur Compounds.** J. C. Patrick, Morrisville, Pa., assignor to Thiokol Corp., Yardville, N. J.

2,142,145. **Vulcanizable Polymers.** J. C. Patrick, Morrisville, Pa., assignor to Thiokol Corp., Yardville, N. J.

2,142,219. **Lubricant.** E. M. Steffen, Berlin, Germany, assignor, by mesne assignments, of three-fourth to Tide Water Associated Oil Co., New York, N. Y.

2,142,220. **Lubricant.** E. M. Steffen, Jersey City, N. J., and J. E. Schott, assignors, by mesne assignments, of three-fourth to Tide Water Associated Oil Co., both of New York, N. Y.

2,142,327. **Lubricant.** J. M. Musselman, assignor to Standard Oil Co., both of Cleveland, O.

2,143,161. **Vulcanizing Agent.** W. E. Messer, Cheshire, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,143,455. **Vulcanizing Agents.** R. L. Sibley, Nitro, W. Va., assignor, by mesne assignments, to Monsanto Chemical Co., St. Louis, Mo.

2,143,470. **Rubber Composition.** W. Becker, Cologne-Mulheim, and A. Koch, Cologne-Deutz, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

2,143,721. **Compounding Ingredient.** H. A. Sweet, Westfield, N. J., assignor to General Dyestuff Corp., New York, N. Y.

Dominion of Canada

378,526. **Vulcanizing Agent.** Canadian Industries, Ltd., Montreal, P. Q., assignee of I. Williams, Woodstown, N. J., and F. R. Mayo, Chicago, Ill., co-inventors, both in the U. S. A.

378,814. **Rubber Hydrohalide and Ester Gum Composition.** Marbon Corp., assignee of H. A. Winkelmann, both of Chicago, Ill., U. S. A.

378,815. **Rubber Hydrohalide and Alkyd Resin Composition.** Marbon Corp., assignee of H. A. Winkelmann, both of Chicago, Ill., U. S. A.

United Kingdom

491,840. **Rubber Reenforced Fibrous Compositions.** J. A. Talalay.

492,181. **Fibrous Chlorinated Rubber Compositions.** S. K. Smith, J. Watson, and Imperial Chemical Industries, Ltd.

492,552. **Colloidal Calcium Carbonate.** T. Shiraishi.

492,557. **Plasticized Rubber.** H. R. Minor.

492,714. **Antioxidant.** British Association of Research for Cocoa, Chocolate, Sugar Confectionery & Jam Trades, T. Macara, W. J. Stainsby, and L. E. Campbell.

492,767. **Halogen Derivatives of Rubber.** R. P. R. Association, (formerly Rubber Producers Research Association), E. H. Farmer, and J. W. Barrett.

492,803. **Antioxidants.** T. A. Clayton.

492,811. **Rubber-Resin Compositions.** Beck, Koller & Co., (England), Ltd.

492,906. **Rubber-like Products from Resins.** Beck, Koller & Co., (England), Ltd.

492,998. **Synthetic Rubber Compositions.** G. W. Johnson. (I. G. Farbenindustrie A.G.).

493,139. **Chlorinated Rubber for Bonding Chloroprene to Metals.** B. J. Habgood and Imperial Chemical Industries, Ltd.

493,167. **Cable Composition.** British Thomson-Houston Co., Ltd.

493,381. **Cellulose Adhesives.** S. D. Warren Co.

GENERAL

United States

2,140,552. **Gas Expanded Product.** D. Roberts, assignor to Rubatex Products, Inc., both of New York, N. Y.

2,140,638. **Hose.** A. D. Maclachlan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,140,677. **Fowl Delouser.** H. B. Holmes, Storm Lake, Iowa.

2,140,716. **Athletic Device.** H. M. Pryale, Pontiac, Mich.

2,140,792. **Vibrator.** H. M. Dressel, Chicago, K. C. Allison, Arlington Heights, and E. J. Mastney, Berwyn, assignors to Oak Mfg. Co., Chicago, all in Ill.

2,140,807. **Vibrator.** E. J. Mastney, Berwyn, assignor to Oak Mfg. Co., Chicago, both in Ill.

2,140,884. **Oarlock Sleeve.** O. J. Shape, Minocqua, Wis.

2,140,892. **Pipe Tester.** W. Brittain, Queensland, Australia.

2,140,952. **Inhaler.** P. J. Clifford, assignor to C. B. Lewis, both of Washington, D. C.

2,141,026. **Tampon Applicator.** P. B. Vallé, assignor to Connecticut Hard Rubber Co., both of New Haven, Conn.

2,141,199. **Fountain Pen.** S. M. Sager, Hubbard Woods, Ill.

2,141,239. **Elastic Garment Seam.** H. Diamond, Cedarhurst, N. Y.

2,141,240. **Lamp.** S. M. Dover, Chicago, Ill.

2,141,250. **Golf Practice Device.** A. Perrault, Detroit, Mich.

2,141,271. **Upholstery.** C. H. Gerlofson, Chicago, Ill.

2,141,290. **Cable.** G. Carlson, Bridgeport, and H. G. Knoderer, Fairfield, both in Conn., assignors to General Electric Co., a corporation of N. Y.

2,141,318. **Container.** L. L. Salfisberg, S. Orange, assignor to Ivers-Lee Co., Newark, both in N. J.

2,141,374. **Horn Button Attachment.** G. L. Callery, New Castle, Del.

2,141,507. **Tire Inflation Controller.** P. M. Bourdon, Paris, assignor to Michelin et Cie, Clermont-Ferrand, both in France.

2,141,542 and 2,141,543. **Tire Inflator.** J. H. Mann, Jr., St. Petersburg, Fla., assignor to Tire Pressure Control, Inc., a corporation of Fla.

2,141,583. **Liquid Dispenser.** J. A. Winger, Indianapolis, Ind.

2,141,608. **Pulpstone.** T. Larsson, assignor to Norton Co., both of Worcester, Mass.

2,141,621. **Battery.** A. Setzer, N. Scituate, R. I.

2,141,648. **Resilient Mount.** H. D. Geyer, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

2,141,796. **Transmission Band.** A. Loges, assignor to Continental Gummi-Werke A.G., both of Hannover, Germany.

2,141,910. **Cable.** N. E. Hayman, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,141,915. **Pulley Construction.** G. E. Hulse, New Haven, Conn., assignor to Safety Car Heating & Lighting Co., a corporation of N. J.

2,141,916. **Hose.** T. A. Johnson, Milford, Conn., assignor to General Electric Co., a corporation of N. Y.

2,142,068. **Game.** L. Berger, Indianapolis, Ind.

2,142,073. **Truss.** O. C. Dobbs, assignor to Dobbs Truss Co., Inc., both of Birmingham, Ala.

2,142,157. **Elastic Welt.** C. W. Seidel, Chicago, Ill.

2,142,182. **Polishing Disk.** P. W. Dempsey, Pittsburgh, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

2,142,201. **Hair Net.** L. Mayer, Chicago, Ill.

2,142,244. **Heel.** A. Hannabach, Pittsburgh, Pa.

2,142,315. **Tire.** C. E. Hershey, Findlay, O.

2,142,320. **Refrigerator Car Floor.** J. S. Lundvall, assignor to Union Asbestos & Rubber Co., both of Chicago, Ill.

2,142,336. **Elastic Smocking.** J. L. Selinger, New York, N. Y.

2,142,414. **Valve.** J. T. Riddell, Chicago, Ill.

2,142,425. **Latch.** T. Tringale, Los Angeles, Calif.

2,142,519. **Door Guide.** H. J. Loftis, assignor to Henrite Products Corp., both of Ironton, O.

2,142,531, 2,142,532, and 2,142,533. **Fountain Pen.** A. H. Stenersen, assignor to Wahl Co., both of Chicago, Ill.

2,142,535. **Brakes.** F. J. Tarris, assignor to India Rubber, Gutta Percha & Telegraph Works Co., Ltd., both of London, England.

2,142,590. **Sealing Ring.** J. N. Smith, Salem, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.

2,142,624. **Stomach Pump.** W. L. Williams, Philadelphia, Pa.

2,142,625. **Cable.** D. A. C. Zoethout, Driehuis-Westerveld, assignor to N. V. Hollandsche Draad-en Kabelfabriek, Amsterdam, both in the Netherlands.

2,142,645. **Hose Supporter.** F. C. Hall, New York, N. Y.

2,142,656. **Bag.** W. W. Rowe, Cincinnati, O., assignor, by mesne assignments, to Bemis Bros. Bag Co., St. Louis, Mo.

2,142,697. **Rotary Surfacing Machine.** H. L. Myers, assignor to American Floor Surfacing Machine Co., both of Toledo, O.

2,142,707. **Suture Package.** J. A. Austin, assignor to Jensen-Salsbery Laboratories, Inc., both of Kansas City, Mo.

2,142,708. **Valve Stem.** G. W. Becker, Silver Lake, assignor, by mesne assignments, to Dill Mfg. Co., Cleveland, both in O.

2,142,725. **Coupling.** J. L. Hardy, assignor of one-half to Hardy, Spicer & Co., Ltd., both of Birmingham, England.

2,142,784. **Coupling.** F. M. Guy, assignor to Guy & Murton, Inc., both of Detroit, Mich.

2,142,872. **Cushioned Connection.** F. L. Haushalter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,142,908. **Elastic Fabric.** W. Mendel, Beverly, assignor to Neidich Cel-lustra Corp., Burlington, both in N. J.

2,142,962. **Pneumatic Filler.** R. Conklin, assignor of one-third to J. F. Ireland, both of Miami, Fla.

2,142,981. **Galosh.** H. B. Richards, Lake Bluff, assignor to Richards, Boggs & King, Inc., Chicago, both in Ill.

2,143,101. **Press Pad.** L. E. Best, E. Orange, N. J., and W. C. Durham, Winchester, assignors, by direct and mesne assignments, to Compo Shoe

Machinery Corp., Boston, both in Mass.

2,143,106. **Oil Packer.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,143,209. **Perforating Device.** A. Rambold, Dresden-Laubegast, Germany.

2,143,409. **Ball.** H. Denkert, assignor to M. Denkert & Co., both of Johnstown, N. Y., a partnership composed of M., J. R., and H. Denkert.

2,143,483. **Baseball Protective Device.** S. Iglauer, Cincinnati, O.

2,143,523. **Anti-skid Device.** L. R. Poe, assignor of one-third to J. J. Fisher and one-third to E. Bennington, all of Bloomington, Ill.

2,143,528. **Tire.** A. A. Thomas, assignor to United States Rubber Co., both of New York, N. Y.

2,143,544. **Golf Ball Cover.** R. A. Crawford, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,143,601. **Fountain Pen.** J. Iversen, Copenhagen, Denmark.

2,143,649. **Conductor Cord.** F. Dansard, Saint-Chamond, France.

2,143,674. **Bathtub.** J. Berger, New York, N. Y.

2,143,712. **Writing Brush.** P. Rissman, assignor to W. and B. Jaekel and W. W. Wutzke, doing business as Jakel Co., all of Detroit, Mich.

2,143,719. **Nipple.** R. W. Schulte, Oklahoma City, Okla.

2,143,739. **Motor Support.** J. J. McCabe, assignor to Apex Electrical Mfg. Co., both of Cleveland, O.

2,143,815. **Apparel Supporting Means.** A. Fridolph, assignor to A. B. A. Specialties Co., Inc., both of New York, N. Y.

2,143,833. **Rubber Stamp.** S. H. Moss, Brooklyn, N. Y.

Dominion of Canada

378,212. **Dish Washer.** Bolinders Fabriks Akt., assignee of T. E. D. Bilde, both of Stockholm, Sweden.

378,213. **Wheeled Structure.** Bassick Co., assignee of W. F. Herold, both of Bridgeport, Conn., U. S. A.

378,258. **Tire.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of C. G. Hoover, Akron, O., U. S. A.

378,267. **Tire Cord.** General Tire & Rubber Co., assignee of W. E. Vecsey, both of Akron, O., U. S. A.

378,321. **Rubber Tread Wheel.** H. T. Auerbach, assignee of A. F. Kaptuller, both of Chicago, Ill., U. S. A.

378,335. **Suspensory.** J. J. Cartledge, Guelph, Ont.

378,338. **Shoe Gore.** R. T. Dawes, Hudson, Mass., U. S. A.

378,394. **Shock Absorber.** Briggs Mfg. Co., Detroit, assignee of J. Tjaarda, Birmingham, both in Mich., U. S. A.

378,413. **Tire.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of E. Eger, Grosse Pointe Park, Mich., U. S. A.

378,441. **Hair Waver.** Rilling-Arnao Co., assignee of P. C. Rilling, both of Minneapolis, Minn., U. S. A.

378,552. **Rope and Cord.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of J. Anderson, Birmingham, England.

378,563. **Life Preserver.** Lifegard Co., Inc., assignee of E. T. Christopher and H. E. Murray, co-inventors, all of Denver, Colo., U. S. A.

378,586. **Dynamite Stick.** A. A. Merke, R. E. McCrellis, and W. C. Coaty, co-inventors, all of Marshfield, Wis., U. S. A.

378,602. **Foundation Garment Attachment.** F. C. Glickman, Montreal.

378,606. **Wheel.** J. O. Maccabee, New York, N. Y., U. S. A.

378,683. **Foundation Garment.** La Resista Corset Co., assignee of C. L. Jasper, both of Bridgeport, Conn., U. S. A.

378,684. **Garment.** F. Longdon & Co. (Canada), Ltd., assignee of H. E. Lewis, both of Toronto, Ont.

378,689. **Hose and Nozzle Assembly.** Norton Co., Worcester, assignee of E. Van der Pyl, Holden, both in Mass., U. S. A.

378,696, 378,698, and 378,699. **Paper Making Machine.** Sandusky Foundry & Machine Co., (formerly Paper & Textile Machinery Co.), assignee of W. H. Millspaugh, both of Sandusky, O., U. S. A.

378,735. **Joint.** B. T. Morgan, Kansas City, Mo., U. S. A.

378,773. **Shoe Cement.** Boston Blacking Co. of Canada, Ltd., Montreal, P. Q., assignee of W. H. Wedger, Belmont, Mass., U. S. A.

378,853. **Fluid Dispenser.** J, H. Cox, inventor, and D. W. Cox, assignee of one-half of the interest, both of Los Angeles, Calif., U. S. A.

378,887. **Boot Fastener.** A. F. Mulka, Dortmund, Germany.

378,897. **Package Fabrication.** L. L. Salfisberg, S. Orange, N. J., U. S. A.

United Kingdom

490,351. **Cycle Spring Forks.** Husqvarna Vapenfabriks Akt.

490,352. **Land Mines.** P. C. Daman.

490,575. **Land Mines.** L. Huybrechts and M. Spilthooren.

490,975. **Vehicle.** L. Mellersh-Jackson. (Marmon-Herrington Co., Inc.)

491,034. **Vehicle Opening-Top.** Vauxhall Motors, Ltd., G. E. Cleaver, and G. H. Hutchins.

491,188. **Soap Holder.** L. J. Arms.

491,198. **Vehicle Opening-Top.** R. E. H. Godfrey.

491,245. **Seat, Mattress, Etc.** Dunlop Rubber Co., Ltd., and W. H. Chapman.

491,261. **Pillow or Bolster.** Dunlop Rubber Co., Ltd., L. Harral, and G. B. Ainsworth.

491,264. **Cycle Frames.** C. A. Voigt.

491,353. **Gun Mountings.** A. Dewandre.

491,358. **Aircraft Cabin.** Junkers Flugzeug - Und - Motorenwerke A.G.

491,458. **Furniture Foot.** North of England School Furnishing Co., Ltd., and J. G. Peirse.

491,479. **Photographic Developing Apparatus.** A. L. V. C. Debrie.

491,480. **Fastenings.** E. De G. Birch.

491,505. **Dual-Control Mechanism.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., D. Webb, and F. J. Tarris.

491,536. **Game.** R. Heimers.

491,538. **Aircraft Control.** Westland Aircraft, Ltd., and W. M. Widgery.

491,578. **Stereoscopic Kinematography.** M. Piguet.

491,677. **Lamp Support.** V. J. C. Guichard.

491,812. **Sound-Recording or Reproducing Device.** B. A. Poctor.

491,855. **Door.** Auto Union A.G.

491,870. **Joint-Making Packing.** N. Isherwood.

491,876. **Fountain Pen.** Mentmore Mfg. Co., Ltd., and W. F. Johnson.

491,991. **Fastening.** W. N. Collins and . R. Barlow.

492,002. **Bearing.** J. W. Leighton.

492,038. **Force Tester.** A. Hiley.

492,061. **Mop.** Briggs, Emmott & Co., Ltd., W. Benham, and G. B. Neal.

492,062. **Razor Blade Sharpener.** A. D. Sanders.

492,075. **Beacon Light.** A. G. Brown and C. C. Paterson.

492,127. **Lifting-Sling.** H. Scott-Paine.

492,158. **Cable.** Okonite Co.

492,165. **Sound-Film Apparatus.** British Ozaphane, Ltd.

492,180. **Fastener.** G. H. C. Corner, E. E. Britton, and Lightning Fasteners, Ltd.

492,191. **Frame.** C. H. R. Davis.

492,204. **Overshoe.** W. J. Tennant. (Akciova Spolecnost Askim Gummivarefabrik.)

492,207. **Nest Box.** P. J. Worsley.

492,226. **Corset.** C. H. Schopbach and L. Babcock.

492,236. **Porous Rubber.** Firestone Tire & Rubber Co., Ltd.

492,244. **Coupling.** British Thomson-Houston Co., Ltd.

492,254. **Headband.** G. L. Tabley.

492,332. **Condenser.** Bryce, Ltd.

492,339. **Screen Making Apparatus.** J. L. Stableford.

492,355. **Football, Etc.** W. C. Crook.

492,373. **Vacuum Cleaner.** Electronaire Marketing Co., Ltd., and W. H. Sones.

492,374. **Gage.** H. E. Kleinschmidt.

492,375. **Conveyer.** Purali, Ltd., and A. Simon.

492,433. **Resilient Support.** M. F. A. Julien.

492,435. **Joint.** M. F. A. Julien.

492,505. **Cables.** Fichtel & Sachs A.G.

492,507. **Garter.** E. Byk.

492,508. **Carton.** A. Astley.

492,517. **Resilient Mounting.** M. Goldschmidt.

492,537. **Compound Sheet Material.** Electrical Research Products, Inc.

492,616. **Bathing Cap.** J. S. Jeans.

492,630. **Vehicle Body.** Auto Union A.G.

492,640. **Gas Mask.** Soc. Italiana Pirelli.

492,690. **Wheel Suspension.** Briggs Mfg. Co.

492,708. **Mold.** Auto Union A.G.

492,723. **Anaesthetic Apparatus.** V. L. L. Hall.

492,738. **Cylindrical Bentwood Articles.** W. Lusty & Sons, Ltd.

492,745. **Barrels.** Katadyn A.G.

492,772. **Strop.** C. T. Geary.

492,775. **Cutlery Case.** B. T. Greaves.

492,783. **Cable.** Etablissements J. Chomat & F. Dansard.

492,784. **Ski Brake.** H. Thirring.

492,785. **Gage.** Gas Light & Coke Co. and C. R. Austen.

492,793. **Window Strip.** A. E. Dutfield, E. J. Rawlings, and Rawlings Mfg. Co., Ltd.

492,823. **Sand-Blast.** A. Stephen & Sons, Ltd., and J. G. Stephen.

492,851. **Valve.** Jenkins Bros.

492,852. **Atomizer.** R. M. Hughes. (Parks-Cramer Co.)

492,865. **Shock Absorber.** V. A. Hoffding.

492,881. **Spring Suspension.** Junkers Flugzeug-Und-Motorenwerks A.G.

492,954. **Shaft Packing.** Simensschuckertwerke A.G.

492,956. **Filtering Media.** W. W. Groves. (I. G. Farbenindustrie A.G.)

492,964. **Battery.** A. Kunze.

492,989. **Wringer.** Acme Wringers, Ltd. and J. W. Burt.

493,107. **Engine Mounting.** M. F. A. Julien and J. F. Paulsen.
493,108. **Electrodeposition of Metals.** A. R. Thomas.
493,120. **Engine Mounting.** M. F. A. Julien and J. F. Paulsen.
493,144. **Tape.** Marathon Paper Mills Co., and A. F. Burgess.
493,145. **Aircraft Spars.** B. Jablonsky.
493,162. **Bathing Cap.** W. W. Haffenden.
493,163. **Draught and Rattle Preventing Strip.** Short Bros. (Rochester & Bedford), Ltd., and A. G. Parks.
493,166. **Tire Inflator.** C. E. Britton.
493,170. **Apparatus to Prepare Bottles for Filling.** Enzinger-Union-Werke A.G.
493,218. **Joints.** Hardy, Spicer & Co., Ltd., and T. A. Waldron.
493,219. **Joint.** Hardy, Spicer & Co., Ltd., and J. A. Daniell.
493,272. **Suspensory.** B. C. Clarke.
493,305. **Garment.** D. R. N. MacCulloch.
493,315. **Compound Sheet Material.** Humoco Corp.
493,396. **Nut.** Dunlop Rubber Co., Ltd., and C. E. Goodyear.
493,425. **Portmanteau.** R. Morszeck.
493,432. **Joint.** Hardy, Spicer & Co., Ltd., and J. L. Hardy.
493,475. **Rust and Scale Remover.** F. A. Luhr.
493,502. **Printing Machine.** H. Renck.
493,514. **Calendars.** E. Alexander.
493,521. **Resilient Mounting.** G. H. Schieferstein.
493,559. **Nipple.** R. Brunel and C. Emorine.
493,680. **Elastic Fabric.** B. J. Moore.
493,710. **Bag Making Apparatus.** F. O. E. Wetzel.
493,784. **Rectal Appliance.** C. H. Taylor.
493,890. **Ash Tray Support.** E. A. Bellow.
493,913. **Cable.** Southern United Telephone Cables, Ltd., W. P. Whitehouse, and A. T. C. Moore.
493,956. **Filter.** F. P. Candy.

Germany

669,113. **Wheel spring.** Continental Gummi-Werke, A.G., Hannover.
669,361. **Twin Pump for Tires.** J., M., and G. Mangold, all of Konstanz.

TRADE MARKS

United States

363,317. Representation of twins through a windshield and the words: **"Sleetex Twins."** Windshield wiper blades. Sleetex Co., Inc., New York, N. Y.
363,331. **State Super Heavy Duty.** Tires. State Tire Co., Philadelphia, Pa.
363,361. **Exide-Tytex.** Storage batteries. Electric Storage Battery Co., Philadelphia, Pa.
363,362. **Tytex.** Storage batteries. Electric Storage Battery Co., Philadelphia, Pa.
363,395. **Dunbar.** Golf balls. R. DeSalvo, New York, N. Y.
363,451. Representation of a walrus containing the words: **"Wall-Rus Fabrics"** Rubber-backed cloth. B. F. Ruskin, New York, N. Y.
363,474. **Flyer.** Tires. Dayton Rubber Mfg. Co., Dayton, O.
363,577. **Daraphane.** Coating compositions. Dewey & Almy Chemical Co., Cambridge, Mass.
363,825. **Grey-Rock Wyrbac.** Brake linings. Raybestos-Manhattan, Inc., Passaic, N. J.
363,826. Representation of a fanciful design. Rubber stamps. Caxton Printers, Ltd., Caldwell, Idaho.
363,889. **Mayon.** Tires. General Tire & Rubber Co., Akron, O.
363,917. **New Era.** Golf balls. R. DeSalvo, New York, N. Y.
363,934. Representation of a **cross** superimposed upon an oval containing the word: **"Unique."** Inner tubes. Phillips Petroleum Co., Bartlesville, Okla.
363,935. **All Weather.** Heels and soles. Goodyear Tire & Rubber Co., Akron, O.
363,948. **Warwick.** Suspenders. Higginbotham-Bailey-Logan Co., Dallas, Tex.
363,952. **It Must Be Right!** Rubber covered wire. Triangle Conduit & Cable Co., Inc., New York, N. Y.

FINANCIAL

Company Reports

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

Dayton Rubber Mfg. Co., Dayton, O. Year ended October 31, 1938: net earnings after all charges, $472,548, equal, after preferred dividend requirements, to $2.15 each on 176,839 shares of common stock outstanding. In the preceding year the net profit was $334,834, or $1.37 each on 176,889 common shares then outstanding. Net sales for the year were $7,392,706, a drop of about 12% from the preceding year.

General Tire & Rubber Co., Akron, O., and subsidiaries. Year ended November 30, 1938: net profit, $1,181,224, after all charges, equal after dividends on the 6% preferred stock to $1.97 each on 519,627 shares of $5-par common stock outstanding. In the preceding year the net profit was $808,913, or $1.24 a share on 517,947 shares then outstanding. Net sales, after all deductions, were $20,088,354, against $21,392,957 in the preceding year, a decrease of 6.1%. On November 30, 1938 current assets were $9,389,285, including $844,072 cash, and current liabilities, $1,762,357. At the end of the preceding fiscal year current assets were $10,287,211, with cash of $689,056, while current liabilities were $3,119,766, including $2,000,000 bank loans. Inventories of $4,975,147 compared with $5,727,953 a year earlier.

During the year the company paid off bank loans totaling $2,000,000 and still had more cash than the year before. It also had no mortgages or funded debt of any kind. The company retired $77,100 of its preferred stock by purchases for sinking fund, leaving $2,594,000 outstanding, while $80,700 of the preferred stock of Aldora Mills, all of whose common stock is owned by General Tire, also was retired.

Lee Tire & Rubber Co., Conshohocken, Pa., and subsidiary. Year ended October 31: net income, $950,598, after all charges, including provision for federal income tax and $51,881 for surtax on undistributed profits, equal to $3.71 each on 255,565 $5 par capital stock shares outstanding, compared with $596,319, or $2.32 a share, in the preceding year, when 257,465 shares were outstanding. Current assets on October 31, 1938, totaled $6,534,924, including $2,111,338 cash and $3,250,710 in inventories. Current liabilities were $1,199,956. At the end of the company's preceding fiscal year current assets were $5,942,754, with $952,157 cash, and inventories amounted to $3,806,980. Current liabilities on October 31, 1937, totaled $971,056.

Seiberling Rubber Co., Akron, O. Year ended October 31, 1938: profit, $447,494.10, after providing for $251,581.68 for depreciation of buildings and machinery and $219,098.17 for interest charges, but before federal income and undistributed profits taxes amounting to $150,000; net profits carried to surplus after all charges, $297,494.10, contrasted with a net loss of $10,443.83 in the preceding fiscal year. Net sales for the year under review were $8,142,386.56, against $8,807,425.51 for 1937. Current assets on October 31 totaled $3,062,947.78, and current liabilities, $860,768.70, a ratio of 3.56 to 1. Consolidated surplus account was $644,512.97 on October 31, having been increased by $297,494.10 during the year. However since the end of the fiscal year Seiberling retired debenture notes amounting to $2,350,000. These were purchased at public sale in New York on December 28 for $752,000, increasing the company's surplus by $1,598,000.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
De Vilbiss Co.	7% Pfd.	$0.17½ q.	Jan. 16	Dec. 31
Dow Chemical Co.	Com.	$0.75 q.	Feb. 15	Feb. 1
Dow Chemical Co.	Pfd.	$1.25 q.	Feb. 15	Feb. 1
Goodyear Tire & Rubber Co.	Com.	$0.25 resumed	Mar. 15	Feb. 15
Goodyear Tire & Rubber Co.	$5 cum cv Pfd.	$1.25 q.	Mar. 15	Feb. 15
Lee Rubber & Tire Corp.	Com.	$0.50 increased	Feb. 1	Jan. 16
Philadelphia Insulated Wire Co.	Com.	$0.25 s.	Feb. 15	Feb. 1
Plymouth Rubber Co.	7% Pfd.	$1.75 q.	Jan. 14	Jan. 10
S. S. White Dental Co.	Com.	$0.15 q.	Feb. 14	Jan. 30

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Nov. 26	Dec. 31	Jan. 7	Jan. 14	Jan. 21
Dec.	15.52	....	....	....	....
Jan.	15.60	16.30	16.01	15.98	15.85
Mar.	15.58	16.40	16.12	16.06	15.95
July	15.65	16.27	16.12	15.95	15.82
Sept.	15.74	16.29	16.17	15.98	15.81
Dec.	....	....	16.12	16.02	15.82
Volume per week (tons) ...	15,760	5,990	4,430	8,080	10,160

New York Quotations

New York outside market rubber quotations in cents per pound

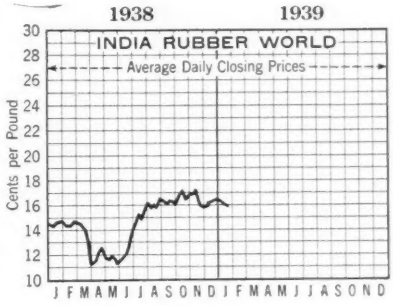
	Jan. 26, 1938	Dec. 28, 1938	Jan. 27, 1939
Plantations			
Rubber latex...*gal.*	56/57	60/61	56/57
Paras			
Upriver fine.....	13¾	14	13
Upriver fine.....	*19¾	*17¾	*17¾
Upriver coarse ...	9	9⅞	9⅝
Upriver coarse ...	*15	*14	*13¾
Islands fine.....	13	13½	12½
Islands fine.....	*18½	*16	*17½
Acre, Bolivian fine	13½	14¼	13⅜
Acre, Bolivian fine	*19½	*18	*18
Beni, Bolivian fine	14½	15¼	14
Madeira fine	13½	14	13
Caucho			
Upper ball.....	9	9⅞	9⅝
Upper ball.....	*15	*14	*13¾
Lower ball.....	8¾	9⅜	9⅜
Pontianak			
Pressed block	14/33	10/16	10/16
Guayule			
Duro, washed and dried	12	12¾	12¾
Ampar	12½	13	13
Africans			
Rio Nuñez.....	16	14	14
Black Kassai	16	14	14
Prime Niger flake.	25	25	25
Gutta Percha			
Gutta Siak	13¾	11	10½
Gutta Soh.....	22	14	15½
Red Macassar	1.25/1.35	90/1.20	90/1.20
Balata			
Block, Ciudad Bolivar	33	28	29
Manaos block	27	28	28
Surinam sheets ...	33	41	42
Amber	39	43	43

*Washed and dried crepe. Shipments from Brazil.

THE Commodity Exchange table published here shows prices of representative future contracts on the New York market the last two months.

The rubber market was somewhat easier during January. A steady decline resulting chiefly from lack of trade interest was partially offset toward the latter part of the month by factory buying prompted by lower prices. After closing at 16.28¢ per pound on January 3, the price of July futures declined steadily to close at 15.78¢ per pound on January 13. Following this the price was steadier, and the market closed at 15.82¢ per pound on January 21. Under the influence of a weaker stock market the price slumped on January 23 to 15.57¢ per pound. The closing price on January 28 was 15.26¢ per pound, the lowest rubber has been in six months. The maximum variation in week-end closing prices for delivery during the next 12 months was 0.11¢ per pound. From the table above it may be seen that on January 21 prices in the distant positions were lower than those of nearby months, a condition which was in evidence throughout December, 1938.

As predicted here last month, the December U. S. consumption figure did not show its customary seasonal drop and held at approximately the same level as for November. It is currently anticipated that the January consumption figure will also hold in the neighborhood of 45,000 tons. With low tire inventories and tire manufacturers expecting a continuance of improved conditions in demand, the outlook for the remainder of the first quarter is promising. Should the present rate of consumption in this country and abroad continue, world stocks will show a further marked decrease by the end of March. Assuming a monthly consumption of 45,000 tons here and 40,000 tons abroad and with exports estimated at 72,000 tons monthly, world stocks would decline nearly 40,000 tons during the first quarter of this year. On page 78 are reported U. S. statistics on imports, consumption, stocks, and crude rubber afloat.



New York Outside Market—Spot Ribbed Smoked Sheets

According to a Reuters dispatch, the Controller in British Malaya stated that licenses for the first quarter of 1939 will be issued up to only 47½% of basic quotas in order to adjust 1939 exports from British Malaya on the basis of over-shipments during 1938. It will be recalled that the International Rubber Regulation Committee fixed permissibles at 50% of basic quotas for the first quarter of 1939.

New York Outside Market

Conditions in the outside market continued generally quiet during January. Some activity was reported toward the latter part of the month with increased factory interest. Indications are, however, that factories are buying only for their immediate requirements. After closing at 16¼¢ per pound on January 3, the price of No. 1 ribbed smoked sheets fluctuated throughout the month within fairly narrow limits, closing at the easier level of 15$\frac{11}{16}$¢ per pound on January 23. The closing price on January 28 was 15$\frac{5}{16}$¢ per pound.

The week-end closing prices on No. 1 ribbed smoked sheets follow: December 31, 16$\frac{3}{16}$¢; January 7, 16$\frac{1}{16}$¢; January 14, 16¢; and January 21, 15$\frac{7}{16}$¢.

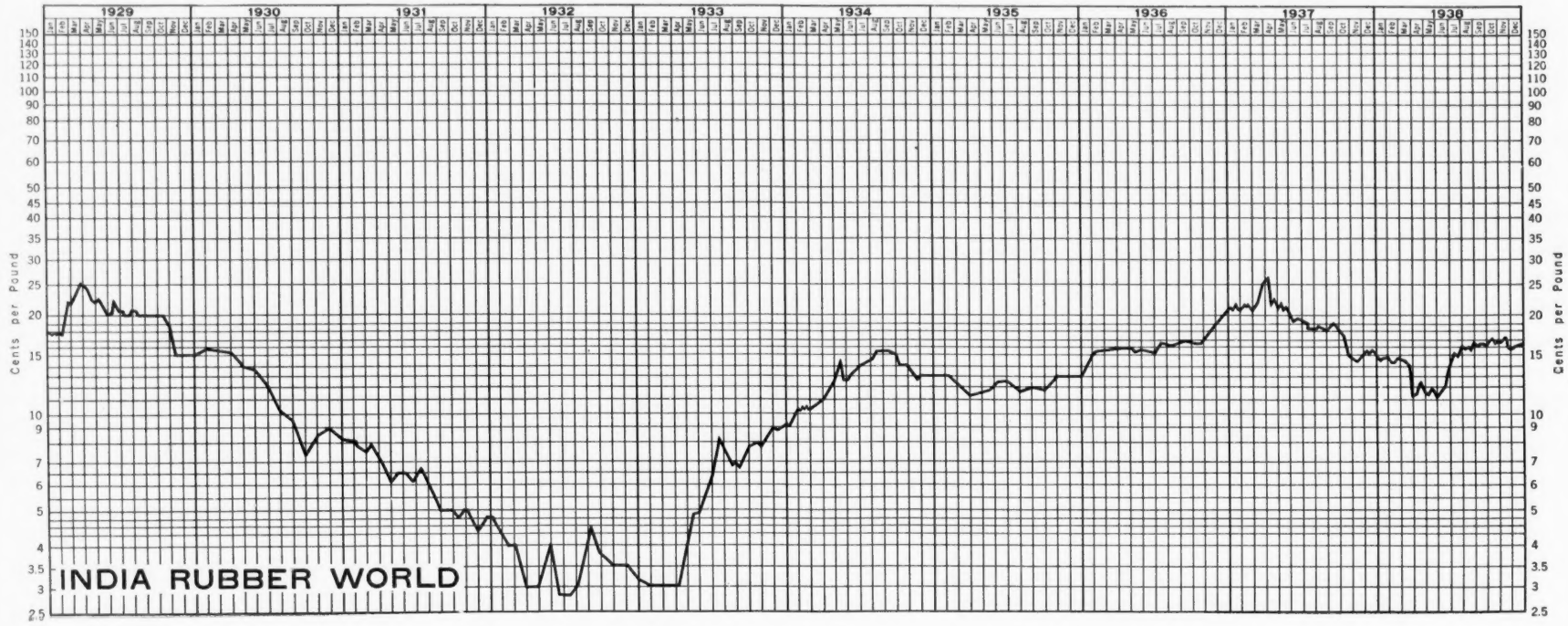
New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	December, 1938						January, 1939																
	26*	27	28	29	30	31	2*	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21
No. 1 Ribbed Smoked Sheet	..	16⅝	16½	16⅜	16⅜	16⅜	..	16¼	16 5/16	16 5/16	16 5/16	16⅛	16⅛	16⅛	16	16 1/16	15 15/16	16	16	15 13/16	15 13/16	16 1/16	16 1/16	15 15/16
No. 1 Thin Latex Crepe	..	17⅝	17½	17⅜	17⅜	17⅜	..	17¼	17 1/16	17 1/16	17 1/16	17⅛	17⅛	17⅛	17	17 1/16	16 15/16	17	17	16 15/16	15 13/16	17 1/16	17 1/16	16 15/16
No. 2 Thick Latex Crepe	..	19¼	19⅛	19	19	19	..	18 7/16	18 5/16	18 5/16	18 5/16	18¾	18¾	18¾	18 5/8	18 1/16	18 1/16	18 1/16	18 5/8	18 1/16	18 1/16	18 1/16	18 1/16	18 1/16
No. 1 Brown Crepe	..	16¼	16⅛	16	16	16	..	15 7/16	15 5/16	15 5/16	15 5/16	15¾	15¾	15¾	15 5/8	15 1/16	15 1/16	15 1/16	15 5/8	15 1/16	15 1/16	15 1/16	15 1/16	15 1/16
No. 2 Brown Crepe	..	16	15 7/16	15¾	15¾	15¾	..	15 5/8	15 1/16	15 1/16	15 1/16	15 1/16	15 1/16	15 1/16	15 3/8	15 1/16	15¼	15 3/8	15 3/8	15¼	15 1/16	15 1/16	15 1/16	15¼
No. 2 Amber	..	16¼	16 1/16	16	16	16	..	15 7/16	15 1/16	15 1/16	15 1/16	15¾	15¾	15¾	15 5/8	15 1/16	15 1/16	15 5/8	15 5/8	15 1/16	15 1/16	15 1/16	15 1/16	15½
No. 3 Amber	..	16	15 7/16	15¾	15¾	15¾	..	15 5/8	15 1/16	15 1/16	15 1/16	15½	15½	15½	15 3/8	15 1/16	15¼	15 3/8	15 3/8	15¼	15 1/16	15 1/16	15 1/16	15¼
Rolled Brown	..	14¾	14 3/8	14½	14½	14½	..	14 3/8	14 1/16	14 1/16	14 1/16	14¼	14¼	14¼	14 1/8	14 1/16	14 1/16	14¼	14¼	14 1/16	14 1/16	14 1/16	14 1/16	14⅛

* Holiday

New York Outside Market—Low and High Spot Rubber Prices in Cents per Pound—1932-1938

		January	February	March	April	May	June	July	August	September	October	November	December
1932,	No. 1 thin latex crepe	4¼/ 5⅛	4⅜/ 4⅜	4⅜/ 4⅝	3⅛/ 4⅛	3⅛/ 5	3⅜/ 3⅛	3⅜/ 4	4 / 5⅜	4 / 5⅛	3⅞/ 4¼	3⅞/ 4⅛	3⅛/ 3⅛
	Ribbed smoked sheet	4⅛/ 4¾	3⅞/ 4¼	3 / 3⅝	2⅛/ 3⅛	2¾/ 4⅜	2⅝/ 2¾	2⅝/ 3⅜	3⅜/ 4⅜	3⅜/ 4⅜	3⅛/ 3⅛	3⅛/ 3⅛	3⅜/ 3⅜
	Upriver fine	5⅛/ 5¾	5¼/ 5⅛	5 / 5¼	5 / 5¼	5⅛/ 5¾	5⅛/....	5⅛/ 5¾	5¾/ 7⅛	6⅛/ 7¾	7¼/ 7¾	7¼/ 7½	6½/ 7½
1933,	No. 1 thin latex crepe	3⅝/ 3⅞	3⅝/ 3⅛	3⅝/ 3⅞	3¾/ 5	5⅜/ 6⅞	5⅜/ 7⅜	7⅜/10½	7½/ 8¾	7½/ 9⅛	7¾/ 8⅞	8½/10⅛	9⅞/10½
	Ribbed smoked sheet	2⅛/ 3¼	2⅞/ 3	2⅛/ 3⅜	2⅛/ 4¼	4⅜/ 6⅛	5¼/ 6⅞	6½/ 9¼	6⅝/ 7⅞	6⅝/ 8¼	6⅜/ 8	7¾/ 9⅛	8½/ 9⅜
	Upriver fine	6 / 6¾	6 /....	6 /....	6 / 6½	6¾/ 8¼	7½/ 8½	8¼/11	9¾/11	8¾/ 9¾	8 / 9¼	8 / 9	9 /....
1934,	No. 1 thin latex crepe	10¾/11¾	11⅛/12⅛	11¾/13¼	13⅛/15¾	14 /17⅛	14¾/16	15⅞/16⅝	16¼/17½	15¾/16¾	13¾/15½	13⅜/14¼	13¼/13⅞
	No. 1 ribbed smoked sheet	8¾/10⅜	9⅛/10¾	10⅜/11⅝	11¾/13⅜	12 /15¾	12¾/14½	13⅛/14⅞	14⅛/15¾	14¾/15⅞	13 /14½	12⅝/13⅜	12¾/13½
	Upriver fine	8¾/ 9	9 / 9⅜	9¼/10¼	10¼/11	11 /13¼	11 /12	11¾/12	11½/11¾	10¾/11⅜	10 /10¾	9¾/10	9½/ 9¾
1935,	No. 1 thin latex crepe	12¾/14⅛	13 /13¾	10⅝/12⅞	10⅞/12¼	11⅜/13	12⅝/13⅛	11⅛/12¾	11⅛/12⅜	11½/12¼	12 /13¾	13⅛/13⅛	13⅛/13⅛
	No. 1 ribbed smoked sheet	12¾/13⅛	12⅜/13⅜	10⅜/12⅜	10⅛/12	11⅜/12¾	12⅛/12⅛	11¾/12⅜	11⅛/12¼	11¼/12	11¾/13½	12⅛/13⅜	12¾/13⅜
	Upriver fine	9¼/ 9⅜	9½/ 9¾	9 / 9½	8¾/ 9½	9¼/ 9½	9½/10½	9¼/10	9¾/10¼	9⅞/10½	10½/12¼	12 /13½	12 /13½
1936,	No. 1 thin latex crepe	13⅞/15⅛	15⅞/16⅜	16⅛/16⅞	16⅛/16⅞	15⅝/16⅜	15⅛/16¼	16⅛/17⅛	16⅛/16⅛	16⅞/17¼	16⅛/17⅛	17¼/19⅜	19¼/24⅛
	No. 1 ribbed smoked sheet	13½/15⅛	15⅛/15¾	15⅝/16⅞	15⅛/16⅛	15⅜/15⅛	15⅝/16⅜	16⅞/16⅛	16⅛/16⅞	16¼/16⅝	16⅜/17⅛	17⅛/18⅜	18½/23
	Upriver fine	12 /13	13 /16½	15¾/16¾	16¾/18¾	17½/18½	17¼/17½	17½/17⅞	17⅞/20½	20½/21	20½/21½	21⅜/23¾	23½/25¼
1937,	No. 1 thin latex crepe	21⅛/23½	22⅛/24½	24⅞/31	24⅞/31½	25 /26½	22¼/25⅝	20 /22⅝	19¼/20	18½/20⅜	15½/18¾	14⅛/16	14⅛/15⅛
	No. 1 ribbed smoked sheet	20⅜/22⅜	20⅛/21⅞	21⅛/26⅞	20⅞/26⅞	20⅜/22½	18½/20⅜	18⅛/19⅝	18⅜/18⅛	17½/19⅜	14¾/17¾	14 /15⅜	14½/15⅜
	Upriver fine	24 /25	25 /....	22 /25	22 /22¾	22 /22¾	20 /22	20 /20¼	19½/20¼	19⅝/19¾	16½/19¾	14⅝/16½	15 /15¼
1938,	No. 1 thin latex crepe	14⅞/15⅝	14¾/15¾	11⅛/15⅛	11⅞/13⅞	12⅛/13⅛	12⅛/15⅛	15⅝/17	16⅜/17⅜	16¼/17⅜	17⅞/18⅛	16⅜/18¼	16⅞/17⅜
	No. 1 ribbed smoked sheet	14⅛/15⅛	14⅛/15	10¼/14⅞	10⅞/12¾	11⅛/12⅛	11⅛/14⅛	14¾/16¼	15⅛/16⅛	15⅛/16⅜	16⅝/17⅜	15⅜/17¼	15⅞/16¾
	Upriver fine	14¼/15	12¾/14¼	10¾/12¾	10¾/11	11 /11¼	11¼/13¾	13¾/15	15 /15¾	15¾/....	15⅜/15¾	15½/....	14⅛/15½



New York Outside Market—Closing Prices Ribbed Smoked Sheets—1929-1938

COMPOUNDING INGREDIENTS

THE improved demand for compounding ingredients in effect during the final quarter of 1938 continued in general through January. Although carbon black and rubber solvents were reported to be somewhat less active, their demand improved steadily during the month. Prices in general continue steady.

CARBON BLACK. Shipments of rubber black during January were reported to be less than in December. Toward the latter part of the month consumption improved, and it is expected that a fairly high rate of activity will prevail throughout the balance of this quarter. The base price continues unchanged.

FACTICE OR RUBBER SUBSTITUTE. The demand for rubber substitutes improved during January. Prices in general remain steady at previously quoted levels.

LITHARGE. A slight improvement in demand was noted during the past month. Prices continue unchanged, being unaffected by the lowering of the import duty or litharge from England.

LITHOPONE. Sales volume of lithopone was fair during January as compared with the inactive demand reported during the past few months. There has been no change in prices.

RUBBER CHEMICALS. Activity in the sales of rubber chemicals during the past month held up to the improved level of the last quarter of 1938. Prices continue substantially unchanged.

RUBBER SOLVENTS. The demand for these solvents was somewhat lower during January. After the year-end lull, however, a steady increase in demand was reported. Prices have held steady at former levels.

STEARIC ACID. There was a fair movement of stearic acid into consuming channels during the past month. Selling schedules were advanced ½¢ per pound, reflecting a strengthening of basic material.

TITANIUM PIGMENTS. Plain and phthalate-treated titanium dioxides were reduced 1¢ per pound during the last week in December. The new prices are effective east of the Rockies only; no report of possible changes on the Pacific Coast has been made yet. Prices of other compound titanium pigments have not been changed. Plain titanium dioxide in carload lots is now quoted at 14¢ and 14½¢ per pound. Demand during the past month has been moderate and considerably higher than the corresponding period in 1938.

Tax reductions to Japanese producers of titanium dioxide has stimulated output in that country, where this pigment is rapidly replacing lithopone. According to the *Oil, Paint & Drug Reporter*, a company recently formed to manufacture titanium oxide in Canada acquired for this purpose a large site at Cap de la Madeleine, near Three Rivers, Quebec.

ZINC OXIDE. The improved demand for zinc oxide by the rubber trade during the final quarter of 1938 continued through January. Prices are steady and unchanged.

New York Quotations

January 25, 1939

Prices Not Reported Will Be Supplied on Application

Abrasives			
Pumicestone, powdered	lb.	$0.03	/$0.035
Rottenstone, domestic	lb.	.03	/ .035
Silica, 15	ton	38.00	
Accelerators, Inorganic			
Lime, hydrated, l.c.l., New York	ton	20.00	
Litharge (commercial)	lb.	.07	/ .075
Accelerators, Organic			
A-1	lb.	.26	
A-5-10	lb.	.35	/ .40
A-7	lb.	.42	/ .55
A-10	lb.	.35	/ .40
A-11	lb.	.52	/ .65
A-19	lb.	.52	/ .65
A-32	lb.	.70	/ .80
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
A-100-F-50	lb.	.25	/ .35
A-433	lb.	.45	/ .55
Accelerator 49	lb.	.42	
737	lb.	.42	/ .43
737-50	lb.	.25	/ .26
808	lb.	.70	/ .72
833	lb.	1.15	
Acrin	lb.	.60	
Aldehyde ammonia	lb.	.70	
Altax	lb.	.55	/ .70
B-J-F	lb.	.50	/ .55
Beutene	lb.	.70	/ .75
Butyl Zimate	lb.	2.65	
C-P-B	lb.	2.00	
Captax	lb.	.50	/ .60
Crylene	lb.	.40	/ .47
Paste	lb.	.30	/ .36
D-B-A	lb.	2.00	
Di-Esterex	lb.	.60	/ .70
N	lb.	.60	/ .70
DOTG (Di-ortho-tolylguanidine)	lb.	.44	/ .46
DPG (Diphenylguanidine)	lb.	.35	/ .45
El-Sixty	lb.	.50	/ .65
Ethylideneaniline	lb.	.42	/ .43
Ethyl Zimate	lb.	2.65	
Formaldehyde P.A.C.	lb.	.0625	
Formaldehydeaniline	lb.	.31	
Formaldehyde-para-toluidine	lb.	.52	/ .54
Guantal	lb.	.40	/ .50
Hepteen	lb.	.35	/ .40
Base	lb.	1.35	/ 1.50
Hexamethylenetetramine U.S.P.	lb.	.47	
Technical	lb.	.36	
Lead oleate, No. 999	lb.	.13	
Witco	lb.	.15	
Monex	lb.	2.65	
Novex	lb.		
O. N. V.	lb.	$1.00	/$1.10
O-X-A-F	lb.	.50	/ .55
Ovac	lb.	.50	/ .55
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	1.00	/ 1.10
Pentex Flour	lb.	.15	/ .16
Pip-Pip	lb.	2.50	
Pipsolene	lb.	1.55	/ 1.85
R-2	lb.	1.40	/ 1.80
Base	lb.	3.65	
R-23	lb.	.40	
R & H 50-D	lb.	.42	/ .43
Rotax	lb.	.60	/ .65
Safex	lb.	1.20	/ 1.30
Santocure	lb.	.80	/ 1.00
Super-sulphur No. 1	lb.	.50	
2	lb.	.18	/ .25
Tetrone A.	lb.	3.00	
Thiocarbanilide	lb.	.24	/ .30
Thionex	lb.	2.65	
Trimene	lb.	.55	/ .65
Base	lb.	1.05	/ 1.20
Triphenylguanidine (TPG)	lb.	.45	
Tuads	lb.	2.65	
Ureka	lb.	.60	/ .75
Blend B	lb.	.60	/ .75
C	lb.	.56	/ .65
Vulcanex	lb.	.42	/ .43
Vulcanol	lb.	.85	
Z-B-X	lb.	2.50	
Z-88	lb.	.44	/ .60
P	lb.	.51	
Zenite	lb.	.46	/ .48
A	lb.	.53	/ .55
B	lb.	.46	/ .48
Zimate	lb.	2.65	
Activator			
Aero Ac 50	lb.		
Barak	lb.	.50	
Age Resisters			
AgeRite Alba	lb.	1.50	/ 2.00
Exel	lb.	1.00	/ 1.40
Gel	lb.	.57	/ .75
Hipar	lb.	.65	/ .92
Powder	lb.	.52	/ .65
Resin	lb.	.52	/ .65
D	lb.	.52	/ .65
White	lb.	1.25	/ 1.65
Akroflex C	lb.	.56	/ .58
Albasan	lb.	.70	/ .75
Aminox	lb.	.52	/ .61
Antox	lb.	.56	
B-L-E	lb.	.52	/ .61
Powder	lb.	.65	/ .74
B-X-A	lb.	.55	/ .61
Copper Inhibitor X-872	lb.	1.15	
Flectol B.	lb.	$0.52	/$0.65
H	lb.	.52	/ .65
White	lb.	.90	/ 1.15
M-U-F	lb.	1.50	
Neozone (standard)	lb.	.63	
A	lb.	.52	/ .54
B	lb.	.63	
C	lb.	.52	/ .54
D	lb.	.52	/ .54
E	lb.	.63	
Oxynone	lb.	.64	/ .80
Parazone	lb.	.68	
Perflectol	lb.	.65	/ .75
Permalux	lb.	1.20	
Santoflex A	lb.	.65	/ .75
B	lb.	.52	/ .65
Santowhite	lb.	.95	/ 1.20
Solux	lb.	1.30	
Thermoflex A	lb.	.65	/ .67
V-G-B	lb.	.52	/ .61
Alkalies			
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	2.70	/ 3.55
liquid, 50%	100 lbs.	1.95	
solid (700 lb. drums)	100 lbs.	2.30	/ 3.15
Antiscorch Materials			
A-F-B	lb.	.35	/ .40
Antiscorch T	lb.	.90	
E-S-E-N	lb.	.35	/ .40
R-17 Resin (drums)	lb.	.10	
RM	lb.	1.25	
Retarder W	lb.	.36	
U.T.B.	lb.	.35	/ .40
Antisun Materials			
Heliozone	lb.	.23	
Sunproof	lb.	.23	/ .25
Colors			
BLACK			
Du Pont powder	lb.	.42	/ .44
Lampblack (commercial)	lb.	.15	
BLUE			
Brilliant	lb.		
Du Pont dispersed	lb.	.83	/ 3.60
Powders	lb.	2.25	/ 3.75
Prussian	lb.	.0375	
Toners	lb.	.08	/ 3.85
BROWN			
Mapico	lb.	.11	
GREEN			
Brilliant	lb.		
Chrome, light	lb.		
medium	lb.	.22	
oxide (freight allowed)	lb.		
Dark	lb.		

Du Pont dispersed	lb.	$0.98	/$1.75
Powders	lb.	1.00	/ 2.00
Guignet's, Easton, Pa., bbls.	lb.	.70	
Light	lb.		
Toners	lb.	.85	/ 3.75
ORANGE			
Du Pont dispersed	lb.	.88	/ .90
Powders	lb.	.80	/ 2.50
Lake	lb.		
Toners	lb.	.40	/ 1.60
ORCHID			
Toners	lb.	1.50	/ 2.00
PINK			
Toners	lb.	1.50	/ 4.15
PURPLE			
Permanent	lb.		
Toners	lb.	.60	/ 2.10
RED			
Antimony			
Crimson, 15/17%	lb.	.45	
R. M. P. No. 3	lb.	.48	
Sulphur free	lb.	.50	
R.M.P.	lb.	.52	
Golden 15/17%	lb.	.28	
7-A	lb.	.37	
Z-2	lb.	.23	
Aristi	lb.	1.75	
Cadmium, light (400 lb. bbls.)	lb.	.70	/ .75
Chinese	lb.		
Crimson	lb.		
Du Pont dispersed	lb.	.93	/ 2.05
Powders	lb.	.55	/ 1.05
Mapico	lb.	.0925	
Medium	lb.		
Rub-Er-Red, Easton, Pa., bbls.	lb.	.0925	
Scarlet	lb.		
Toners	lb.	.08	/ 2.00
WHITE			
Lithopone (bags)	lb.	.04½/	.04¾
Albalith Black Label-11	lb.	.04½/	.04¾
Astrolith	lb.	.04½/	.04¾
Azolith	lb.	.04½/	.04¾
Cryptone-19	lb.	.05⅝/	.05⅞
CB-21	lb.	.05¼/	.05⅛
ZS No. 20	lb.	.07⅞/	.08⅛
86	lb.	.08¾/	.08⅞
230	lb.	.08¾/	.08⅞
Sunolith	lb.	.04¼/	.04¾
Ray-Bar	lb.	.05⅝/	.06⅜
Ray-Cal	lb.	.05⅝/	.06⅜
Rayox	lb.	.14	/ .17
Titanolith (5-ton lots)	lb.	.05⅝/	.05⅞
Titanox-A (50-lb. bags)	lb.	.14	/ .143/4
B (50-lb. bags)	lb.	.05⅝/	.05⅞
30 (50-lb. bags)	lb.	.05⅝/	.05⅞
C (50-lb. bags)	lb.	.05⅝/	.05⅞
M	lb.	.05⅜/	.05¾
Ti-Tone	lb.		
Zinc Oxide			
Azo ZZZ-11	lb.	.0625/	.065
44	lb.	.0625/	.065
55	lb.	.0625/	.065
66	lb.	.0625/	.065
French Process, Florence			
White Seal-7 (bbls.)	lb.	.085	/ .0875
Green Seal-8	lb.	.08	/ .0825
Red Seal-9	lb.	.075	/ .0775
Kadox, Black Label-15	lb.	.065	/ .0675
No. 25	lb.	.075	/ .0775
Red Label-17	lb.	.065	/ .0675
Horse Head Special 3	lb.	.0625/	.065
XX Red-4	lb.	.0625/	.065
23	lb.	.0625/	.065
72	lb.	.0625/	.065
78	lb.	.0625/	.065
80	lb.	.0625/	.065
103	lb.	.0625/	.065
110	lb.	.0625/	.065
St. Joe (lead free)			
Black Label	lb.	.0625/	.065
Green Label	lb.	.0625/	.065
Red Label	lb.	.0625/	.065
U.S.P.	lb.	.095	/ .0975
White Tack	lb.	.07¾/	.08⅛
Zopaque	lb.	.14	/ .1475
YELLOW			
Cadmolith (cadmium yellow), 400 lb. bbls.	lb.	.45	/ .50
Du Pont dispersed	lb.	1.25	/ 1.75
Powders	lb.	.155	/ 1.37
Lemon	lb.		
Mapico	lb.	.0675	
Toners	lb.	2.50	

Dispersing Agents

Darvan	lb.	.30	/ .47
Nevoll (drums)	lb.	.0215	
Santomerse S	lb.	.11	/ .25

Fillers, Inert

Asbestine, c.l., f.o.b., mills	ton	15.00	
Barytes	ton	30.00	/36.00
f.o.b., St. Louis (50 lb. paper bags)	ton	22.85	
off color, domestic	ton	20.00	/25.00
white, imported	ton	29.00	/32.00
Blanc fixe, dry, precip.	lb.	.03	/ .035
Calcene	ton	37.50	/43.00
Infusorial earth	lb.	.02	/ .03
Kalite No. 1	ton	$24.00	/$50.00
3	ton	34.00	/ 60.00
Magnesia, calcined, heavy	lb.	.04	
Carbonate, l.c.l.	lb.	.07	/ .095
Pyrax A	ton	6.50	/20.00
Whiting			
Columbia Filler	ton	9.00	/ 14.00
Guilders	100 lbs.		
Hakuenka	lb.		
Paris white, English cliff-stone	100 lbs.		
Southwark Brand, Commercial	100 lbs.		
All other grades	100 lbs.		
Suprex, white extra light	ton	45.00	/60.00
heavy	ton	45.00	/60.00
Witco, c.l.	ton	6.00	

Finishes

Rubber lacquer, clear	gal.		
colored	gal.		
Starch, corn, pwd.	100 lbs.		
potato	lb.		
Talc	ton	25.00	/45.00

Flock

Cotton flock, dark	lb.	.11	/ .13
dyed	lb.	.45	/ .80
white	lb.	.13	/ .18
Rayon flock, colored	lb.	1.10	/ 1.50
white	lb.	.90	

Latex Compounding Ingredients

Accelerator 85	lb.	.35	
89	lb.	1.40	
122	lb.	1.55	
552	lb.	2.50	
Aerosol	lb.	.45	
Antox, Dispersed	lb.	.42	
Aquarex A	lb.	.35	
D	lb.	.75	
F	lb.	.85	
WA Paste	lb.	.25	
Areskap No. 50	lb.	.18	/ .24
100, dry	lb.	.39	/ .51
Aresket No. 240	lb.	.16	/ .22
300, dry	lb.	.42	/ .50
Aresklene No. 375	lb.	.35	/ .50
400, dry	lb.	.51	/ .65
Black No. 25, Dispersed	lb.	.22	/ .40
Catalpo	ton		
Collocarb	lb.	.055	/ .07
Color Pastes, Dispersed	lb.	.35	/ 1.90
Dispersex No. 15	lb.	.11	/ .12
No. 20	lb.	.08	/ .10
Emo, brown	lb.	.15	
white	lb.	.15	
Factice Compound, Dispersed	lb.	.36	
Heliozone, Dispersed	lb.	.25	
Igepon A	lb.		
MICRONEX, Colloidal	lb.	.055	/ .07
Nekal BX (dry)	lb.		
Palmol	lb.	.11	
Pipsol X	lb.	3.05	/ 3.55
R-23	lb.	.57	
RN-2	lb.	1.40	/ 1.80
S.1 (400 lb. drums)	lb.	.65	
Santomerse D	lb.	.41	/ .65
S	lb.	.11	/ .25
No. 1	lb.	.18	/ .35
No. 2	lb.	.18	/ .35
No. 3	lb.	.40	/ .65
No. 3P	lb.	.29	/ .45
Santovar A	lb.	1.15	/ 1.40
Stablex A	lb.	.90	/ 1.10
B	lb.	.65	/ .90
C	lb.	.40	/ .50
Sulphur, Dispersed	lb.	.10	/ .15
No. 2	lb.	.075	/ .15
T.1. (400 lb. drums)	lb.	.40	
Tepidone	lb.	1.55	
Vulcan Colors	lb.		
Zinc oxide, Dispersed	lb.	.12	/ .15

Mineral Rubber

Black Diamond	ton	25.00	
Genasco Hydrocarbon, granulated, (fact'y)	ton		
solid	ton		
Gilsonite Hydrocarbon (factory)	ton		
Hydrocarbon, hard	ton	22.00	/42.00
Parmr Grade 1	ton	25.00	/27.00
2	ton	25.00	/27.00
Pioneer	ton		
285°-300°	lb.	22.00	/42.00

Mold Lubricants

Mold Paste	lb.	.12	/ .18
Sericite	ton	65.00	/75.00
Soapbark	lb.		
Soapstone	ton	25.00	/35.00

Oil Resistant

AXF	lb.	.40	/ .50

Reenforcers

Carbon Black			
Aerfloted Arrow Specification Black	lb.	.0275/	.0625
Arrow Compact Granulized Carbon Black	lb.	.0275/	.0625
"Certified" Heavy Compressed, Cabot	lb.		
Spheron	lb.		
Carbitum	ton	$58.00	/$63.00
Continental Dustless, c.l.	lb.	.0275/	.0375
Compressed c.l.	lb.	.0275/	.0375
Uncompressed, c.l.	lb.	.0275/	.0375
Disperso, c.l.	lb.	.0275/	.0375
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Dixiedensed, c.l., f.o.b., New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Dixiedensed, 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Excello, c.l., f.o.b Gulf ports	lb.	.0275/	.0475
delivered New York	lb.	.0375/	.0575
l.c.l., delivered New York	lb.	.0625/	.07
Fumonex, c.l., f.o.b. works	lb.	.03	
ex-warehouse	lb.	.05	
Gastex	lb.	.03	/ .07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Kosmobile 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Kosmos c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275	
c.l., delivered New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
MICRONEX Beads, c.l., f.o.b. Gulf ports	lb.	.0275	
c.l., delivered, New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Mark II, c.l., f.o.b Gulf ports	lb.	.0275	
c.l., delivered, New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Standard, c.l., f.o.b. Gulf ports	lb.	.0275	
c.l., delivered, New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
W-5, c.l., f.o.b., Gulf ports	lb.	.0275	
c.l., delivered, New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
W-6, c.l., f.o.b., Gulf ports	lb.	.0275	
c.l., delivered, New York	lb.	.0375	
local stock, bags, delivered	lb.	.0625	
Paradene No. 2 (drums)	lb.	.04	
Pelletex	lb.	.03	/ .07
Supreme, c.l., f.o.b. Gulf ports	lb.	.0275/	.0475
delivered New York	lb.	.0375/	.0575
l.c.l., delivered New York	lb.	.0625/	.07
"WYEX BLACK"	lb.	.0275/	.0625

Clays

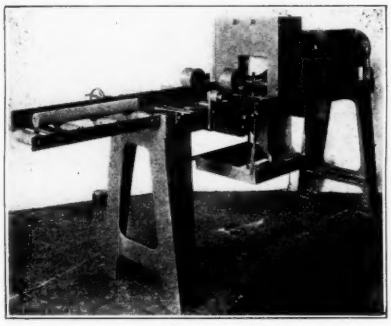
Aerfloted Paragon (50 lb. bags)	ton	9.50	/22.00
Suprex (50 lb. bags)	ton	9.50	/22.00
China	ton	17.50	/20.00
Dixie	ton	11.00	/26.00
Junior	ton	9.50	/24.00
McNamee	ton	9.50	/22.00
Par	ton	9.50	/22.00
Witco, f.o.b. works	ton	9.50	
P-33	lb.	.0475/	.0775
Thermax	lb.	.0175/	.05
Velvetex	lb.	.022	/ .035

Reodorants

Amora A	lb.		
B	lb.		
C	lb.		
D	lb.		
Curodex 19	lb.	2.75	
188	lb.	3.50	
198	lb.	4.50	
Rodo No. 0	lb.	3.50	/ 4.00
10	lb.	4.50	/ 5.00

(Continued on page 84)

A NEW SLICER FOR EXTRUDED STOCKS



With High Speed Disc Cutting Blade, Automatic Feed and with Tandem Feed Wheels. Capacity Section Up to 3" by 4½"—Length ⅛" to 6".

Utility Manufacturing Company

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Export Representative: BINNEY & SMITH CO., 41 East 42nd Street, New York, N. Y.

Long Distance Phone Call MILWAUKEE—SHERIDAN 7020

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Pure Titanium Dioxide

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MOST *Effective*

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Chemically pure, stable, inert.

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Baltimore, Md. · Collinsville, Ill. · Oakland, Calif.

Manufactured by

American Zirconium Corporation

Baltimore, Maryland

Regular and Special Constructions

of

COTTON FABRICS

Single Filling Double Filling

and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Nov. 26	Dec. 31	Jan. 7	Jan. 14	Jan. 21
Dec.	8.69	....	....	....	....
Jan.	8.49	8.43	8.39	8.36	....
Mar.	8.45	8.43	8.41	8.42	8.49
July	8.02	8.00	7.94	7.91	7.92
Sept.	7.81	7.78	7.58	7.65	7.61
Dec.	....	7.69	7.41	7.55	7.41

New York Quotations

January 25, 1939

Drills	
38-inch 2.00-yard.....yd.	$0.11
40-inch 3.47-yard.....	.06¾
50-inch 1.52-yard.....	.15⅝
52-inch 1.85-yard.....	.12¾
52-inch 1.90-yard.....	.11¾
52-inch 2.20-yard.....	.10¾
52-inch 2.50-yard.....	.09½
59-inch 1.85-yard.....	.12
Ducks	
38-inch 2.00-yard D.F.....yd.	.10½/.11
40-inch 1.45-yard S. F.....	.17
51½-inch 1.35-yard D. F.....	.15¾
72-inch 1.05-yard D. F.....	.21½/.22
72-inch 17.21-ounce	.24
Mechanicals	
Hose and belting.....lb.	.25
Tennis	
52-inch 1.35-yard.....yd.	.17⅛
Hollands	
Gold Seal and Eagle	
20-inch No. 72.....yd.	.09
30-inch No. 72.....	.16
40-inch No. 72.....	.18
Red Seal and Cardinal	
20-inch .....yd.	.07½
30-inch	.13¾
40-inch	.15
50-inch	.24
Osnaburgs	
40-inch 2.34-yard.....yd.	.09½
40-inch 2.48-yard	.08¾
40-inch 2.56-yard	.08
40-inch 3.00-yard	.07½
40-inch 7-ounce part waste.....	.07
40-inch 10-ounce part waste.....	.10⅝
37-inch 2.42-yard.....	.09
Raincoat Fabrics	
Cotton	
Bombazine 60 x 64.....yd.	.07¼
Plaids 60 x 48.....	.10
Surface prints 60 x 64.....	.11
Print cloth, 38½-inch, 60 x 64.	.04⅜
Sheetings, 40-Inch	
48 x 48, 2.50-yard.....yd.	.06⅞
64 x 68, 3.15-yard.....	.06⅝
56 x 60, 3.60-yard.....	.05½
44 x 40, 4-25-yard.....	.04⅜
Sheetings, 36-Inch	
48 x 48, 5.00-yard.....yd.	.04
44 x 40, 6.15-yard.....	.03⅛
Tire Fabrics	
Builder	
17¼ ounce 60" 23/11 ply Karded peeler .....lb.	.27
Chafer	
14 ounce 60" 20/8 ply Karded peeler .....lb.	.27
9¼ ounce 60" 10/2 ply Karded peeler .....lb.	.26
Cord Fabrics	
23/5/3 Karded peeler, 1 1/16" cotton .....lb.	.28
15/3/3 Karded peeler, 1 1/16" cotton .....lb.	.26
23/5/3 Karded peeler, 1¼" cotton .....lb.	.33½
23/5/3 Combed Egyptian....lb.	.47
Leno Breaker	
8¼ ounce and 10¼ ounce 60" Karded peeler .....lb.	.29

Safety Hint

Flexible tubing for gas is dangerous. Gas always should be conveyed through permanent pipes. When this is not possible and flexible tubing must be used, it should be of the very best type. *The Safe Worker (N.S.C.).*

THE accompanying table of week-end closing prices on the New York Cotton Exchange shows the week-end change of representative futures covering the past two months.

The New York spot middling price closed at 8.65¢ per pound on January 3. During the first week the price fell off, closing at 8.44¢ on January 10; this trend was reversed during the second week, leaving the closing price at 8.63¢ on January 21. The closing price on January 28 was 8.53¢ per pound.

Sales at 13 southern markets totaled 151,097 bales during 16 days since January 3, against 349,429 bales for the same days one year ago.

Consumption of all cotton in domestic mills during December totaled 565,307 bales, against 596,289 in November and 432,328 in December, 1937, according to a report of the Census Bureau.

The Department of Commerce reported that cotton exports from the United States during the calendar year 1938 totaled 4,316,000 bales, value $224,322,000, a decrease of 1,412,000 bales, or 24.7%, in quantity and $135,701,000, or 37.7%, in value from the 5,728,000 bales, value, $360,023,000, shipped the previous year.

Fabrics

The demand for cotton textiles of coarse-yarn construction and for sheetings showed marked improvement during January. Tire fabrics, which are being bought in quantities sufficient for nearby requirements only, have been less active in demand. A steady improvement in market conditions is anticipated during the remainder of this quarter.

In the drills, ducks, and osnaburgs groups a stronger market was reflected in a number of price increases. Sheetings and cotton raincoat fabrics weakened with minor price reductions being registered. Other fabrics held steady at last month's quotations.

IMPORTS, CONSUMPTION, AND STOCKS

CRUDE rubber consumption by United States manufacturers in December is estimated at 45,315 long tons, against 46,169 (revised) long tons during November, a decrease of 1.8%, but 55.2% over the 29,195 (revised) long tons consumed in December, 1937, according to R. M. A. Consumption for 1938 is estimated at 411,363 long tons. Although this represents a decrease of 24.3% under 1937, the consumption for the fourth quarter of 1938 totaled 131,817 long tons, 29.3% more than in the corresponding period in 1937.

Gross imports of crude rubber for December are reported to be 36,977 long tons, 19.1% over the November figure of 31,054 long tons, but 45.9% under the 68,305 long tons imported in December, 1937. Annual gross imports for 1938 amounted to 400,178 long tons, against 584,851 long tons for 1937.

Total domestic stocks of crude rubber on hand December 31 are estimated at 245,413 long tons, compared with November 30 stocks of 254,196 (revised) long tons and 262,204 long tons on hand December 31, 1937.

Crude rubber afloat to U. S. ports as of December 31 is estimated at 45,105 long tons, against 51,114 long tons afloat on November 30 and 63,099 long tons afloat on December 31, 1937.

London and Liverpool Stocks

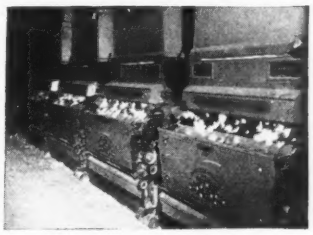
Week Ended	Tons London	Tons Liverpool
December 31.....	55,632	31,056
January 7.....	55,481	30,724
January 14.....	53,528	29,883
January 21.....	52,283	29,183

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption¶ Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1936	490,858	575,000	223,000	56,567	78,462	26,969	855,600	1,044,695	538,028
1937	584,851	543,600	262,204	63,099	57,785	44,792	1,135,337	1,103,560	639,025
1938									
January ..	42,135	29,429	274,581	57,356	62,108	48,494	80,372	**70,853	a634,330
February .	43,930	23,868	294,338	47,459	71,516	46,241	81,008	61,418	a653,791
March	35,967	30,487	299,172	41,882	76,617	50,797	81,172	79,034	a670,332
April	30,807	27,984	301,436	39,071	82,754	40,614	86,725	71,114	a668,440
May	27,410	28,947	299,720	32,859	87,215	40,598	64,406	77,726	a653,865
June	26,011	30,629	294,566	32,079	92,312	44,729	70,871	70,382	a670,068
July	22,918	32,209	284,914	40,400	95,252	45,529	79,630	73,806	a670,873
Aug.	31,099	38,170	277,463	47,772	99,614	41,002	74,598	73,999	a654,704
Sept.	37,374	37,823	276,586	48,927	98,140	35,386	70,860	78,882	a646,378
Oct.	34,496	40,333	269,937	51,062	93,272	34,901	75,023	84,555	a634,017
Nov.	31,054	46,169	254,196	51,114	90,073	31,255	67,050	86,248	.....
Dec.	36,977	45,315	245,413	45,105	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. **Not including additional absorption from U. K. manufacturers' stocks for any month during 1937. The figure will be included in yearly total. a Japan stocks not included.

HOW COTTON FABRICS ARE MADE . . .



COTTON GOES FROM FIELD TO GIN
where fibers are removed from the cotton seed by the revolving sawtoothed bands of the gin. The fiber is then baled.

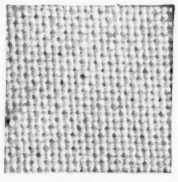
THE CLASSIFICATION OF COTTON FIBERS

Soil and climatic conditions affect the length and character of cotton fiber, the color and the amount of foreign matter present. For these reasons, it has been necessary to establish standards of grades and staple which are accepted by the cotton trade of the world. Certain grades and staples of cotton are designated by the name of the country or section of a country of origin, such as American, Egyptian, China, Indian, etc.

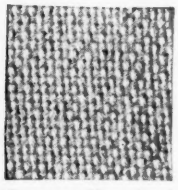
There is a further commercial grading consisting of 7 major classes with many sub-divisions. The major grades, running from best to poorest are—

I Fair (best) III Good Middling V Low Middling
II Middling Fair IV Middling VI Good Ordinary
VII Ordinary (poorest)

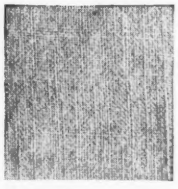
The relative fineness of the cotton fiber itself seems to vary directly with the length of the staple. The shortest staple is the coarsest fiber. Physically the cotton fiber resembles a collapsed tube which has twisted itself from 100 to 300 times per inch of its length. The outer surface of the fiber is covered with a wax-like coating which protects it and tends to make it adhere to other fibers.



Shawmut Chafer Fabric



Shawmut Hose Duck



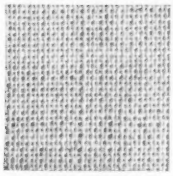
Columbus Sheeting

Have you ever heard the story of our BELT CLINIC?

We have been running a clinic for sick belts for over 20 years. Broken down belts come here for an expert diagnosis of their ailments and the causes of them.

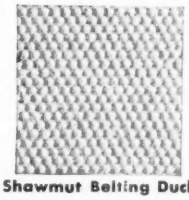
Specialists examine and study every case and from the resulting data are able to develop a sturdy rugged line of belt ducks for the rubber industry.

Our Belt Clinic is just one more example of the practical thoroughness of our experience and service. The study of broken down belts may reveal a weakness related to the selection of the basic fibers used in its construction. That's why we are so careful to blend the right cottons before we start to weave our ducks. We welcome the opportunity to work with rubber engineers toward the solution of their fabric problems.



West Point Osnaburg

Varwick Balloon Cloth



Shawmut Belting Duck

WELLINGTON SEARS COMPANY

65 WORTH STREET, NEW YORK, N. Y.

RUBBER SCRAP

THE demand for scrap rubber during the past month was fair, with scrap tires and tubes leading. Activity is expected to reach a higher level during February and March.

The market is generally steady with the exception of tubes and tires, which strengthened their position during the past month. The following tube grades made small fractional advances: No. 2, compound; red; and mixed tubes. Mixed auto tires with beads and auto tire carcass scrap also showed an increase. All other grades of scrap continue unchanged at last month's levels.

CONSUMERS' BUYING PRICES
(Carload Lots Delivered Eastern Mills)
January 24, 1939

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01 /$0.01⅛
Colored	lb.	.00¾/ .00⅞
Untrimmed arctics	lb.	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	lb.	.08 / .08½
No. 2, compound	lb.	.03¼/ .03⅜
Red	lb.	.03⅝/ .03¾
Mixed tubes	lb.	.03⅝/ .03¾
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	12.00 /12.50
Beadless	ton	15.00 /16.00
Auto tire carcass	ton	18.50 /19.50
Black auto peelings	ton	16.00 /17.00
Solid		
Clean mixed truck	ton	22.50 /25.00
Light gravity	ton	30.00 /32.50
Mechanicals		
Mixed black scrap	ton	15.00 /17.50
Hose, air brake		20.00 /22.50
Garden, rubber covered	ton	10.00 /12.50
Steam and water, soft	ton	10.00 /12.50
No. 1 red	lb.	.03 / .03¼
No. 2 red	lb.	.02 / .02¼
White druggists' sundries	lb.	.03½/ .03¾
Mixed mechanicals	lb.	.02¼/ .02½
White mechanicals	lb.	.03½/ .03¾
Hard Rubber		
No. 1 hard rubber	lb.	.11 / .11½

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalgar Sq., London, W.C.2, England, gives the following figures for December, 1938:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham.

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	4,528	478
United States	15,088	570
Continent of Europe	6,936	382
British possessions	2,348	106
Japan	1,507	5
Other countries	942	11
Totals	31,349	1,552

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	2,195	47
Dutch Borneo	241	1
Java and other Dutch islands	35	..
Sarawak	555	1
British Borneo	98	1
Burma	253	5
Siam	2,161	476
French Indo-China	1,263	205
Other countries	69	1
Totals	6,870	737

RECLAIMED RUBBER

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption†	Consumption % to Crude	U. S. Stocks*	Exports
1936	150,571	141,486	24.6	19,000	7,085
1937	185,033	162,000	29.8	28,800	13,233
1938	113,482	113,341	27.6	21,769	...
1938					
Jan.	7,698	6,940	23.6	28,900	658
Feb.	6,198	7,141	29.9	27,487	470
Mar.	6,875	8,471	27.8	25,432	459
Apr.	6,399	7,480	26.7	23,339	426
May	6,866	8,009	27.7	22,275	550
June	7,584	8,274	27.0	21,040	658
July	7,109	8,273	25.7	18,832	720
Aug.	10,472	10,732	28.1	17,892	557
Sept.	12,016	11,281	29.8	18,127	759
Oct.	13,558	11,803	29.3	19,090	732
Nov.	13,993	12,668	27.5	19,823	564
Dec.	14,712	12,269	27.1	21,769	...

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage.
Compiled by The Rubber Manufacturers Association, Inc.

ACCORDING to R. M. A. statistics, December reclaimed rubber consumption is estimated at 12,269 long tons, 3.2% under that of November; production at 14,712 long tons; and stocks on hand December 31, 21,769 long tons. Reclaimed rubber consumption for the year 1938 totaled 113,341 long tons against 162,000 (revised) long tons in 1937. Production of reclaimed rubber for 1938 is estimated at 113,482 long tons, which compares with 185,033 (revised) long tons produced during 1937. Following the year-end lull, demand has been resumed at the preholiday level, and it is expected that January consumption wil approach that of the preceding month. Demand for reclaim is now originating from all principal lines of rubber manufacture using this material. The current favorable level of activity is expected to hold during the remainder of this quarter.

The market is steady, and all grades of reclaim remain unchanged at last month's levels.

New York Quotations
January 24, 1939

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6 / 6¼
Acid	1.18-1.22	7 / 7¼
Shoe		
Standard	1.56-1.60	6½/ 6¾
Tubes		
No. 1 Floating	1.00	12 /12¼
Compound	1.10-1.20	8 / 8¾
Red Tube	1.15-1.30	8 / 8¼
Miscellaneous		
Mechanical Blends	1.25-1.50	4½/ 5
White	1.35-1.50	11½/12

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

U. S. Trade in Rubber Manufactures for November and First 11 Months of 1938[1]

Foreign trade of the United States in rubber manufactures during November, 1938, remained practically unchanged from the average of the preceding nine months. Imports of $81,065 worth of foreign rubber goods showed an increase of 10.9% from the figure of $73,079 for October, 1938. As compared with the six-month average of $99,106, November imports declined 18.2%, and a similar comparison with the nine-month average of $88,841 showed a decline of 8.8%. Total imports for the first 11 months of 1938 were $954,632, indicating a decline of 49% from the 1937 total of $1,870,733.

Exports of United States rubber manufactures for November worth $2,178,327 increased 0.14% over the six-month average of $2,175,150 and 0.02% over the nine-month average of $2,177,679. November rubber exports declined 26.1% over the October figure of $2,948,926. A comparison of the eleven-month total of $24,726,070 for 1938 showed a decline of 16.4% from the 1937 total of $29,563,843. Summarization of United States exports of rubber manufactures in the first 11 months of the last two years with percentages of increase or decrease for each item follows:

UNITED STATES EXPORTS OF RUBBER GOODS

	First Eleven Months 1937	1938	% Change
Tires, inner tubes, repair materials, and tire sundries	$14,575,407	$12,380,433	—15.1
Footwear, soles and heels	1,088,581	829,811	—23.8
Mechanical rubber goods	5,050,973	4,058,236	—19.8
Rubberized fabrics	993,489	870,630	—12.4
Specialties and sundries	2,323,609	2,246,181	— 3.3
Hard rubber goods	544,155	455,867	—16.2
Semi-manufactured goods	3,420,358	2,420,876	—29.2
All others	1,567,271	1,464,036	— 6.6
Total	$29,563,843	$24,726,070	—16.4

[1] Trade paper press release, United States Leather and Rubber Division, Bureau of Foreign and Domestic commerce, Jan. 4, 1939.

Editor's Book Table

NEW PUBLICATIONS

"Aero Ac 50." American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y. 48 pages. Aero AC 50, the subject of this booklet, is a new delayed action activator for use with a thiazole-type accelerator. Formulas and test data are given which compare the effectiveness of the new activator with D.P.C. phthalate. Also included are formulas with test data for tire tread compounds, black and white tennis soles, and hot water bottle compounds. Aero Ac 50 as a primary accelerator is compared with D.O.T.G. and D.P.G.

"Report of the Thirty-First Fiscal Period—Dominican Customs Receivership under the American-Dominican Convention of 1924, Together with Summary of Commerce for the Year 1937." United States Government Printing Office, Washington, D. C., 132 pages. This annual report of the Dominican Republic's customs receivership contains statistical tables of customs collections and disbursements and the volume of imports and exports for the year 1937 with comparative data for 1936. Included are import statistics on tires and inner tubes for carriages and all other rubber products by countries of origin.

"Federal Precision Measuring Instruments." Federal Products Corp., Providence, R. I. 64 pages. This catalog, No. 38, illustrates and describes the firm's complete line of gages and related measuring equipment for indicating the dimensional qualities of a wide variety of products. Seven new gages are included, and a number of improvements on older models are pointed out.

"Twenty-second Annual Report of The United States Tariff Commission. 1938." United States Tariff Commission, Washington, D. C. 68 pages. This yearly report which covers recent and current activities of the commission includes: summaries of reports completed during 1938; outline of the program of work on commodity surveys, trade practices, etc., now in progress; litigation under the Tariff Acts of 1922 and 1930; work under the Trade Agreement Act; cooperation with other government departments; Works Progress Administration tariff projects; and the commission's administrative activities. Copies at 10¢ each may be obtained from the Superintendent of Documents, Washington, D. C.

"Commodity Exchange, Inc., Sixth Annual Report, November 30, 1938." Commodity Exchange, Inc., 81 Broad St., New York, N. Y. 12 pages. President Floyd Y. Keeler covers briefly important occurrences of the exchange's last fiscal year, including the series of educational lectures by the board of governors, as the one on rubber by Charles Slaughter; the record of trading activity, in which rubber is revealed to have the largest dealings, although 16.6% less than in 1937, which, incidentally, was the best year the exchange enjoyed; forecast for 1939; and membership changes. The Rubber Inspection Bureau during the fiscal year under review provided the exchange with a net income of $5,746.07. Also given are the balance sheet as of November 30, 1938, operating income and expense for the year ending November 30, 1938, and estimate of income and expense for the year ending November 30, 1939.

"List of Inspected Gas, Oil, and Miscellaneous Appliances." December, 1938. Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago, Ill. 130 pages. This semi-annual list, covering devices, materials, and systems which have been examined with reference to fire and accident hazards, includes carbon black; gasoline hose of the rubber-metal and synthetic rubber types; sheet packing for use with hazardous liquids; and millinery cement made of rubber dissolved in carbon tetrachloride and benzene.

"Bristol's Air Switches. Bulletin 517." The Bristol Co., Waterbury, Conn. 8 pages. Air switches for the manual remote control of valves are described in this bulletin. This line of equipment includes: toggle switches, selector switches, throttling valves, air-electric switches, bellows type switches, safety switches, and pilot valves.

"Annual Report of the Insular Collector of Customs, For Fiscal Year Ending December 31, 1937." Commonwealth of the Philippines, Bureau of Customs, Manila. 362 pages. This volume contains the classified statistical record of commerce of the Philippines under the general divisions of imports, exports, customs collections and disbursements, and shipping. Import data on rubber products show that 86% (based on value) of the total originate in the United States. In the case of rubber exports 61.5% (value basis) of the total is sent to this country.

BOOK REVIEWS

"Toxicity of Industrial Organic Solvents." Summaries of Published Work Compiled by Ethel Browning. The Chemical Publishing Co., of N. Y., Inc., 148 Lafayette St., New York, N. Y. 1938. Cloth, 5½ by 8¼ inches, 392 pages. Index. Price $3.50.

With the increasing use of volatile chemicals which have injurious effects upon the health of workers, the need was felt of an investigation which would determine the actual toxic effects of each substance under conditions likely to be met with in industry. This book, which represents the first step in this direction, contains conveniently within a single volume the essential information that has been published on this subject. It is intended, in addition to serving as an aid to further research, to assist manufacturers and users of industrial solvents in the solution of their health problems. The chemicals covered in this book are: the hydrocarbons, chloro compounds; alcohols; esters; cyclohexane derivatives; ketones; glycol compounds; carbon bisulphide; pyridine; ethyl ether; and iso-propyl ether.

"Industrial Chemistry." Second Edition. Wm. Thornton Read. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y. 1938. Cloth, 5¾ by 9 inches, 605 pages. Index. Price $5.

The general plan and arrangement of this book, revised and brought up-to-date, follow closely those of the first edition. In presenting a well-balanced picture of modern industries from the standpoint of chemistry and chemical engineering, the book serves as an introduction to the more detailed works on specialized industry, thus filling the need of a diversified class of readers.

As in the first edition, both journal references and illustrative problems have been omitted. The first few chapters are introductory in nature and cover such subjects as: relation of chemistry to industry; chemical organizations; sources of information; analytical control; unit operations; and materials of construction. In the chapter on unit operations the fundamental laws and principles are not discussed, but the more important operations are presented with descriptions of typical relevant equipment. Attention is given, for example, to the handling of materials, the application of heat, and such operations as disintegration, mechanical and phase change separation, and mixing. Equipment described

which finds direct application in the rubber industry include: the Banbury mixer, ball and colloid mills, centrifugals, hydraulic presses, and the various types of equipment for handling and weighing materials. Rubber is discussed in the chapter on materials of construction, chiefly as a protective coating of metals in the handling of corrosive materials. Mention is also made of synthetic and modified rubbers.

The remaining three-quarters of the book is devoted to specific industries, emphasis being placed in each case on the application of chemical and chemical engineering principles. The chapter on rubber presents a brief picture of the history, chemistry, and processing of this material and summarizes its more important uses. Detail has necessarily been omitted in order to maintain the book's proper perspective. Thus, while the chapter on rubber is limited to a somewhat elementary treatment, the collateral ideas advanced in other sections may be suggestive and helpful to the rubber technologist.

"Pick Your Job—and Land It!" S. W. and M. G. Edlund. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York, N. Y. 1938. Cloth, 6 by 9 inches, 300 pages. Price $3.

The program for job-seekers, both the unemployed and those wanting better positions, set forth in this book has been successfully tested by the authors in their Man Marketing Clinic, operating under the auspices of the Sales Executives' Club of New York. The authors contend that, assuming the job candidate has the necessary qualifications, he can obtain the desired position if he properly presents these qualifications to a sufficient number of prospective employers. How to do this is answered in the pages of this book. Specific examples of methods that have resulted in success and those that have proved negative are cited. A final chapter on job insurance urges the reader to plan his future, to be his own public relations man, and to be prepared to change his job if necessary or desirable.

New England

(*Continued from page* 61)

The Carr Mfg. Co., maker of elastic thread, Bristol, R. I., plans a $15,000 one-story brick addition to its plant on Buttonwoods Ave., to be used for both office and industrial purposes. The plant has at present approximately 60,000 square feet of floor space. The company, of which Arthur Carr is president, recently completed a one-story addition costing about $5,000.

Arthur D. Little, Inc., consulting chemist and engineer, Cambridge, Mass., in order to be able to devote full attention to the steadily increasing industrial research has discontinued routine testing and chemical analysis, other than as required for the research and development work on which the organization is principally engaged. Requests for routine analyses and tests will be referred to Skinner & Sherman, Inc., 246 Stuart St., Boston, Mass. Both Hervey J. Skinner and Herbert L. Sherman of that company were at one time executives of Arthur D. Little, Inc. Harold C. Parish, for many years assistant director of the analytical department of the Little organization, is joining Skinner & Sherman, Inc., and Roger C. Griffin will serve on its board of directors for the coming year.

A pessimist has said that the willing horse gets the heaviest load. But you'll notice that he also develops the strongest muscles and generally gets the most oats.—*The Safe Worker* (N.S.C.).

United States Latex Imports

Year	Pounds (d.r.c.)	Value
1936	44,469,504	$6,659,899
1937	51,934,040	10,213,670
1938		
Jan.	3,135,524	$494,242
Feb.	3,772,897	560,883
Mar.	2,192,459	327,844
Apr.	1,991,943	295,690
May	1,968,576	279,502
June	1,556,507	214,420
July	1,420,136	209,526
Aug.	1,963,304	308,573
Sept.	1,529,673	235,242
Oct.	1,961,404	347,348
Nov.	2,284,011	394,082

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	12 Mos., 1938 No.	%	12 Mos., 1937 No.	%
Drop Center Rims, 16" Diameter and Under				
16x4.00D	8,198	0.1	13,367	0.1
16x4.25D	.....	..	277,238	1.2
16x4.50D	7,893	0.1	518	0.0
15x3.00D	57,711	0.5	100,336	0.5
15x3.50D	46	0.0	.....	..
15x5.00F	69,320	0.6	931	0.0
15x5.50F	106,474	1.0	339,816	1.5
16x3.50D	290,823	2.7	1,687,015	7.6
16x4.00E	4,878,018	46.0	9,320,769	41.4
16x4.25E	418,273	3.9	1,132,033	5.1
16x4.50E	1,591,210	15.0	3,528,433	15.9
16x5.00F	772,931	7.3	1,086,990	4.9
16x5.50F	59,302	0.6	138,272	0.6
16x6.00F	24,178	0.2	25,945	0.1
Semi Drop Base Rims, 16" Diameter				
16x4.50E	9,957	0.1	40,447	0.2
16x5.50F	49,470	0.5	141,018	0.6
Drop Center Rims, 17" Diameter and Over				
17x3.00D	2,895	0.0	8,435	0.0
17x3.25E	6,764	0.1	45,347	0.2
17x3.62F	3,974	0.0	50,408	0.2
17x4.00F	266	0.0	356	0.0
17x4.19F	.....	..	959	0.0
17x5.00F	167	0.0	6,274	0.0
18x2.15B	29,046	0.3	34,541	0.1
18x3.00D	3,450	0.0	5,205	0.0
18x3.25E	3,047	0.0	10,499	0.0
18x3.62F	19,099	0.2	53,504	0.2
18x4.00F	3,544	0.0	4,760	0.0
18x4.19F	7,662	0.1	22,370	0.1
19x2.15B	1,099	0.0	3,224	0.0
19x3.00D	.....	..	2,703	0.0
19x3.25E	248	0.0	915	0.0
19x3.62F	.....	..	12,414	0.1
20x3.25E	6,588	0.1	12,963	0.1
20x3.62F	2,662	0.0	.....	..
21x3.00D	962	0.0	.....	..
21x3.25E	5,679	0.1	15,413	0.1
22x3.25E	3,108	0.0	986	0.0
Flat Base Passenger Rims				
All Sizes	3,523	0.0	28,603	0.2
Rims for High Pressure Tires				
All Sizes	232	0.0	1,463	0.0
Clincher Rims				
All Sizes	1,155	0.0	6,723	0.0
15" Truck and Bus Rims				
15x5	144	0.0	.....	..
15x7	3,714	0.0	4,954	0.0
15x8	2,300	0.0	2,052	0.0
15x9/10	15	0.0	.....	..
17" Truck and Bus Rims				
17x5	63,163	0.6	3,354	0.0
17x6	51,860	0.5	76,145	0.3
18" Truck and Bus Rims				
18x5	302	0.0	.....	..
18x6	3,368	0.0	9,396	0.0
18x7	15,078	0.1	43,661	0.2
18x8	16,766	0.2	12,182	0.1
18x9/10	2,516	0.0	7,376	0.0
20" Truck and Bus Rims				
20x5	344,778	3.3	1,087,942	4.9
20x6	864,632	8.1	1,726,448	7.8
20x7	244,453	2.3	486,262	2.2
20x8	91,473	0.9	177,948	0.8
20x9/10	14,392	0.1	31,914	0.1
20x11	3,240	0.0	2,973	0.0
22" Truck and Bus Rims				
22x7	540	0.0	355	0.0
22x8	12,582	0.1	18,268	0.1
22x9/10	5,504	0.1	5,801	0.0
24" Truck and Bus Rims				
24x5	.....	..	101	0.0
24x6	1,512	0.0	5,649	0.0
24x7	2,399	0.0	6,752	0.0
24x8	3,876	0.0	13,382	0.1
24x9/10	9,059	0.1	15,610	0.1
24x11	4,153	0.0	4,517	0.1
Tractor and Implement Rims				
12x2.50C	124	0.0	.....	..
12x3.00D	5,031	0.0	4,495	0.0
13x5.50F	3,742	0.0	.....	..
15x3.00D	48,370	0.5	.....	..
16x3.00D	1,147	0.0	355	0.0
16x6.00F	8,996	0.1	.....	..
18x3.00D	1,159	0.0	652	0.0
18x5.50F	10,792	0.1	6,911	0.0
19x3.00D	.....	..	307	0.0
20x4.50E	4,123	0.0	10,014	0.0
20x5.00F	2,262	0.0	.....	..
20x5.50F	7,673	0.1	5,557	0.0
21x3.00D	925	0.0	3,041	0.0
22x4.50E	6,464	0.1	1,761	0.0
24x3.00D	13	0.0	.....	..
24x5.50F	.....	..	577	0.0
30x3.00D	1,484	0.0	1,417	0.0
28x4.00E	44	0.0	28	0.0
36x4.50E	718	0.0	1,844	0.0
40x3.00D	61	0.0	.....	..
40x4.00E	331	0.0	.....	..
40x4.50E	289	0.0	17	0.0
40x5.50F	27	0.0	.....	..
44x4.00E	164	0.0	.....	..
24x5.50R	34,115	0.3	.....	..
32x5.50R	3,249	0.0	.....	..
36x5.50R	6,572	0.1	.....	..
40x5.50R	6,665	0.1	.....	..
20x8.00T	1,084	0.0	52	0.0
24x6.00S	6,215	0.1	21,163	0.1
24x8.00T	64,717	0.6	70,608	0.3
28x6.00S	3,687	0.0	4,236	0.0
28x8.00T	26,008	0.2	64,761	0.3
32x8.00T	7,663	0.1	7,974	0.0
36x6.00S	40,332	0.4	63,309	0.3
36x8.00T	67,535	0.6	52,729	0.2
40x6.00S	24,869	0.2	22,841	0.1
40x8.00T	1,121	0.0	5	0.0
42x8.00T	510	0.0	416	0.0
44x8.00T	186	0.0	819	0.0
Cast Wheels				
10x5.00F	1,281	0.0	2,783	0.0
10x6.00F	405	0.0	1,052	0.0
15x2.50D	.....	..	166	0.0
24x15	421	0.0	410	0.0
Airplane Rims				
All Sizes	780	0.0	3,229	0.0
Totals	10,612,138		22,257,964	

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

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Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
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YOUNG TECHNICAL EXECUTIVE, UNIVERSITY graduate, with 12 years' experience in the rubber latex and plastics industry desires to establish himself in a technical executive capacity with a medium-sized, progressive rubber company. Presently associated as chief chemist and technical director. Address Box No. 1054, care of INDIA RUBBER WORLD.

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FOR SALE: CONCRETE STEEL FULLY EQUIPPED TIRE PLANT also suitable for mechanical goods. Experienced labor available. Address Box No. 1048, care of INDIA RUBBER WORLD.

IF YOU ARE A PRODUCER OF RAW MATERIALS USED BY rubber plants and would be interested in Ohio representation, address Box No. 1050, care of INDIA RUBBER WORLD.

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(*Advertisements continued on page 85*)

New York Quotations

(Continued from page 76)

Rubber Substitutes		
Black	lb.	$0.07 / $0.11
Brown	lb.	.07 / .10
White	lb.	.08 / .11½
Factice		
Amberex	lb.	.19
Brown	lb.	.07 / .10
Fac-Cel B	lb.	.12
C	lb.	.12
Neophax A	lb.	.0975
B	lb.	.0975
White	lb.	.08 / .11
Softeners		
Bondogen	lb.	.98 / 1.50
Burgundy pitch	lb.	.06
Cychne oil	gal.	.14 / .20
Nuba resinous pitch (drums)		
Grades No. 1 and No. 2	lb.	.0265
Grade No. 3	lb.	.04
Nubalene Resin	lb.	.03
Palm oil (Witco), c.i.	lb.	.0575
Pine tar	gal.	
Plastogen	lb.	.0775/ .12
R-19 Resin (drums)	lb.	.10
R-21 Resin (drums)	lb.	.10
Reogen	lb.	.115 / .26
Rosin oil, compounded	gal.	.40
RPA No. 1	lb.	.65
2	lb.	.65
3	lb.	.46
Rubtack	lb.	.10
Tackol	lb.	.085 / .18
Tonox	lb.	.52 / .61
Tonox D	lb.	.75 / .85
Witco No. 20	gal.	.20
X-1 Resinous oil (tank car)	lb.	.01
Solvents		
Beta-Trichlorethane	gal.	
Carbon bisulphide	lb.	
tetrachloride	lb.	
Industrial 90% benzol (tank car)	gal.	.16
Skellysolve	gal.	
Stabilizers for Cure		
Laurex, ton lots	lb.	.12 / .14
Stearex B	lb.	.10 / .11
Beads	lb.	.09 / .10
Stearic acid, single pressed	lb.	.10 / .11
Stearite	100 lbs.	.09
Zinc stearate	lb.	.23
Synthetic Rubber		
Neoprene Type E	lb.	$0.65
G	lb.	.70
GW	lb.	.75
H	lb.	.78
M	lb.	.65
Latex Type 57	lb.	.30
"Thiokol" A	lb.	.30
DX	lb.	.45
Molding Powder	lb.	.60
Varnish		
Shoe	gal.	1.45
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.035 /$0.04
Rubber	100 lbs.	2.65
Telloy	lb.	1.75
Vandex	lb.	1.75
(See also Colors—Antimony)		
Waxes		
Carnauba, No. 3 chalky	lb.	.37½
2 N.C.	lb.	.39½
3 N.C.	lb.	.37½
1 Yellow	lb.	.4575
2	lb.	.4425
Montan, crude	lb.	.11

Rubber and Canvas Footwear Production Statistics

Thousands of Pairs

	Inventory	Production	Shipments
1936	13,615	70,831	71,915
1937	20,430	74,102	67,191
1938			
Jan.	20,031	3,588	3,937
Feb.	20,296	3,639	3,212
Mar.	20,558	4,453	4,197
Apr.	20,400	3,566	3,837
May	20,563	3,811	3,648
June	20,791	3,970	3,742
July	19,469	2,719	4,041
Aug.	17,897	4,254	5,803
Sept.	16,246	4,709	6,360
Oct.	16,321	5,067	4,991
Nov.	15,695	5,513	6,139

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

U. S. Crude and Waste Rubber Imports for 1938

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Totals 1938	Totals 1937	Balata	Miscellaneous	Waste
Jan. tons	39,744	1,259	411	177	6	538	42,135	32,820	41	526	8
Feb.	41,709	1,400	453	150	..	218	43,930	43,289	35	808	22
Mar.	34,252	801	371	278	..	205	35,907	52,039	37	555	93
Apr.	29,662	690	324	...	1	130	30,807	35,850	73	1,046	33
May	25,967	696	195	326	1	225	27,410	50,840	32	647	5
June	25,141	640	20	60	..	150	26,011	48,956	35	901	23
July	21,883	656	64	52	9	254	22,918	39,108	57	828	12
Aug.	29,560	880	170	170	..	319	31,099	48,785	84	649	14
Sept.	36,190	837	221	26	25	75	37,374	56,049	92	889	80
Oct.	32,564	795	408	450	153	126	34,496	52,508	70	729	38
Nov.	29,470	1,057	410	...	35	82	31,054	56,302	85	458	199
Dec.	35,163	1,042	410	168	13	181	36,977	68,305	37	593	34
Total 12 mos., 1938 tons	381,305	10,813	3,457	1,857	243	2,503	400,178	.....	678	8,629	561
Total 12 mos., 1937 tons	553,521	21,590	5,607	1,203	188	2,742	.....	584,851	463	8,044	3,323

Compiled from The Rubber Manufacturers Association, Inc., statistics.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.†	Australia	Belgium	Canada	Czecho-Slovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1936	475,500	62,700	14,400	9,600	27,900	8,800	56,800	71,800	16,000	61,700	31,000	65,100	831,800
1937	592,528	137,351	19,257	14,969	36,087	13,063	59,959	98,170	23,980	62,205	30,462	77,389	1,120,500
1938													
Jan.	45,596	17,811	617	1,258	1,789	1,102	4,780	6,314	1,809	4,935	693	6,264	90,615
Feb.	40,977	19,149	621	974	615	1,771	5,420	6,959	2,000	3,173	2,341	5,958	87,314
Mar.	42,075	18,134	1,084	961	2,123	1,323	4,823	10,768	1,365	6,222	2,162	6,332	95,150
Apr.	31,870	16,572	647	904	999	920	5,721	6,497	2,397	5,456	4,281	6,220	80,565
May	27,809	17,783	1,087	1,137	2,545	957	5,249	9,595	2,422	3,328	4,163	7,290	80,257
June	26,429	15,314	825	853	3,243	988	4,552	7,478	2,399	2,156	504	7,109	70,589
July	22,209	13,555	1,251	1,106	2,685	636	4,543	6,927	3,641	3,100	541	6,623	65,939
Aug.	31,493	14 925	1,444	1,238	1,832	595	3,560	7,190	2,078	2,034	739	6,106	71,200
Sept.	34,436	11,218	1,588	519	1,405	608	5,072	7,390	1,799	3,586	1,735	7,116	73,344
Oct.	33,830	7,632	1,800	848	3,139	9	3,804	6,326	3,921	3,206	2,000*	10,632	72.599

*Estimated. †U. K. figures show gross imports, not net imports. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Total	Philippines and Oceania	Liberia†	Other Africa	South America	Mexican Guayule	Grand Total
1936	353,700	309,600	49,700	8,600	5,800	8,200	21,000	34,600	40,800	832,000	1,600*	1,600	4,500	14,700	1,200	855,600
1937	469,960	431,674	70,358	9,778	7,232	13,213	25,922	35,551	43,374	1,107,062	1,617*	2,251	5,427	16,288	2,692	1,135,337
1938																
Jan.	30,998	26,466	5,222	841	538	1,307	3,485	2,897	6,088	77,842	138	501	415	938	538	80,372
Feb.	37,166	27,366	5,216	639	770	918	8	3,266	3,070	78,419	125	168	438	1,640	218	81,008
Mar.	33,567	31 268	3,834	532	703	853	1,564	2,837	3,213	78,371	159	108	501	1,883	150	81,172
Apr.	44,744	28,487	1,951	485	842	1,158	1,728	1,583	3,647	84,625	201	308	318	1,085	188	86,725
May	28,011	22,036	2,833	909	561	815	1,648	2,507	3,118	62,438	120	175	284	1,160	229	64,406
June	28,048	24,428	3,693	625	693	643	2,441	3,904	4,776	69,251	198	110	353	809	150	70,871
July	25,055	35,035	3 861	601	482	937	2 057	4,710	5,139	77,877	126	311	371	722	223	79,630
Aug.	33,618	23,103	4,401	647	306	728	965	4,793	3,840	72,401	204	125	500	1,118	250	74,598
Sept.	30,485	20,170	3,990	824	212	284	756	3,893	8,139	68,753	208	445	453	828	173	70,860
Oct.	25,788	29,882	4,893	832	279	1,075	1,612	4,438	3,638	72,437	128	222	460	1,650	126	75,023
Nov.	29,214	19,191	6,355	682	601	567	929	3,223	4,035	64,797	150*	274	450*	1,229	150*	67,050

*Estimated. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Classified Advertisements

Continued

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United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	November, 1938		Eleven Months Ended November, 1938	
UNMANUFACTURED—*Free*	Quantity	Value	Quantity	Value
Liquid latex (solids)....*lb.*	2,284,011	$394,082	23,776,434	$3,667,352
Jelutong or pontianak....*lb.*	688,324	76,452	18,401,497	2,706,851
Balata ....*lb.*	14,201	24,725	1,111,185	174,877
Gutta percha ....*lb.*	21,547	18,148	480,956	125,666
Guayule ....*lb.*	131,000	12,923	5,160,460	583,950
Siak ....*lb.*	104,531	10,040	303,217	32,680
Scrap and reclaimed....*lb.*	1,422,062	23,633	6,620,353	111,696
Totals	4,799,276	$560,003	55,854,102	$7,403,072
Misc. rubber (above), 1,000 *lbs.*	4,799	$560,003	55,854	$7,403,072
Crude rubber....1,000 *lbs.*	71,465	10,572,345	809,960	112,755,804
Totals ....1,000 *lbs.*	76,264	$11,132,348	865,814	$120,158,876
Chicle, crude ....*lb.*	203,758	$71,125	6,704,125	$2,019,922
MANUFACTURED—*Dutiable*				
Rubber tires ....*no.*	1,599	$2,109	19,285	$53,515
Rubber boots, shoes, and overshoes ....*prs.*	2,494	683	62,627	11,692
Rubber soled footwear with fabric uppers ....*prs.*	75,401	17,190	829,633	164,498
Golf balls ....*no.*	13,536	931	523,039	51,127
Lawn tennis balls....*no.*	5,230	594	496,518	50,570
Other rubber balls....*no.*	46,704	2,029	2,178,261	68,391
Other rubber toys....*lb.*	10,407	1,966	253,481	41,720
Hard rubber combs....*no.*	64,224	4,787	611,441	43,039
Other manufactures of hard rubber	.....	901	.....	17,161
Friction or insulating tape.*lb.*	24,490	1,343	114,517	6,297
Belts, hose, packing, and insulating material	.....	7,947	.....	66,721
Druggists' sundries of soft rubber	.....	2,497	.....	55,781
Inflatable swimming belts, floats, etc. ....*no.*	8,724	692	398,087	33,129
Other rubber and gutta percha manufactures....*lb.*	53,835	13,783	712,853	179,295
Totals	.....	$57,452	.....	$842,936

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber ....*lb.*	929,816	$146,276	11,709,901	$1,657,760
Balata ....*lb.*	14,409	5,755	373,678	114,307
Other rubber, rubber substitutes and scrap....*lb.*	710	153	119,873	22,145
Rubber manufactures (including toys)	.....	1,627	.....	13,123
Totals	.....	$153,811	.....	$1,807,335

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ....*lb.*	1,263,714	$66,373	14,672,008	$787,560
Scrap ....*lb.*	5,982,964	97,295	54,481,683	925,647
Cements ....*gal.*	64,234	57,546	406,490	422,853
Rubberized auto cloth..*sq. yd.*	35,445	21,021	281,338	137,111
Other rubberized piece goods and hospital sheeting..*sq. yd.*	130,220	58,262	1,973,677	733,519
Boots ....*prs.*	4,457	9,914	75,038	159,652
Shoes ....*prs.*	7,034	4,459	187,945	104,434
Canvas shoes with rubber soles ....*prs.*	40,358	24,576	432,606	302,755
Heels ....*doz. prs.*	23,023	14,765	344,713	189,235
Soling and top lift sheets.*lb.*	55,152	9,941	407,217	73,735
Gloves and mittens..*doz. prs.*	9,287	18,248	88,168	185,288
Water bottles and fountain syringes ....*no.*	20,944	7,168	248,192	83,719
Other druggists' sundries....	.....	47,723	.....	549,510
Gum rubber clothing....*doz.*	20,767	32,248	281,327	520,497
Balloons ....*gross*	74,908	54,761	545,608	419,919
Toys and balls	.....	26,120	.....	151,552
Bathing caps ....*doz.*	1,244	2,279	41,045	80,918
Bands ....*lb.*	18,224	8,068	219,893	89,312
Erasers ....*lb.*	18,670	10,644	308,123	165,466
Hard rubber goods				
Electrical battery boxes.*no.*	20,048	13,161	208,503	144,905
Other electrical ....*lb.*	28,494	6,768	343,636	77,092
Combs, finished ....*doz.*				
Other hard rubber goods..	10,09f	7,362	200,168	85,663
Tires	.....	18,223	.....	148,207
Truck and bus casings.*no.*	23,297	418,888	229,488	4,528,393
Other auto casings ....*no.*	44,759	446,678	541,370	5,731,805
Tubes, auto ....*no.*	44,847	66,007	482,392	794,983
Other casings and tubes..*no.*	6,785	48,341	67,214	542,832
Solid tires for automobiles and motor trucks....*no.*	124	4,058	2,439	71,343
Other solid tires....*lb.*	20,500	3,807	409,858	74,222
Tire sundries and repair materials	.....	47,737	.....	636,855
Rubber and friction tape..*lb.*	84,443	17,522	610,688	179,977
Fan belts for automobiles.*lb.*	52,626	28,945	517,516	274,266
Other rubber and balata belts ....*lb.*	207,699	118,472	2,563,272	1,334,905
Garden hose ....*lb.*	101,012	19,132	629,297	120,957
Other hose and tubing....*lb.*	307,070	121,500	3,971,745	1,524,945
Packing ....*lb.*	116,642	51,811	1,020,237	476,348
Mats, matting, flooring, and tiling ....*lb.*	137,782	19,613	959,422	146,838
Thread ....*lb.*	31,225	22,323	411,345	284,816
Gutta percha manufactures.*lb.*	22,251	8,017	935,290	291,663
Other rubber manufactures..	.....	118,551	.....	1,172,373
Totals	.....	$2,178,327	.....	$24,726,070

Imports by Customs Districts

	—November, 1938— *Crude Rubber		—November, 1937— *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	9,140,780	$1,518,593	8,658,034	$1,573,381
St. Lawrence	.....	.....	57	9
New York	51,093,212	7,681,886	88,224,832	15,266,502
Philadelphia	128,925	20,495	1,926,773	328,478
Maryland	2,757,848	383,733	5,330,099	899,551
Virginia	55,554	6,400	.....	.....
Georgia	106,450	15,754	.....	.....
Mobile	550,703	76,549	.....	.....
New Orleans	1,449,910	202,425	2,667,922	449,619
Los Angeles	7,930,237	974,353	14,313,049	2,237,267
San Francisco	504,224	75,435	303,886	53,014
Oregon	16,800	2,442	13,440	2,386
Washington	11,200	1,863	.....	.....
Colorado	134,400	19,422	.....	.....
Michigan	.....	.....	67,200	12,220
Ohio	.....	.....	113,808	27,622
Totals	73,880,243	$10,979,350	121,619,100	$20,850,049

*Crude rubber including latex dry rubber content.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
2555	Manufacturers and exporters of Holland cloth.
2556	Manufacturer of a water dispersible resin that is a tack producer and rubber softener, suitable for latex adhesive compounding.
2557	Supplier of pellets for insertion in hollow balls to produce gas pressure.
2558	Manufacturer of rubber insulation, "Impervex."
2559	Suppliers of Italian Sienna clay.
2560	Manufacturers using latex in paper making.
2561	Manufacturer of sheet gutta percha for the tailoring trade.
2562	Manufacturer of rubberized canvas.
2563	Suppliers of gutta percha.
2564	Suppliers of smoked sheets.
2565	Supplier of latex for making molds.
2566	Manufacturers of tire repair materials.
2567	Manufacturers of druggists' sundries.
2568	Manufacturer of rubber flower pot saucers.
2569	Manufacturer of Neoprene Cement #1282-N-8.
2570	Manufacturer of small tubular pocket case of hard rubber suitable for holding a glass test tube full of oil.
2571	Manufacturers of imitation leather.
2572	Manufacturer of machinery to make camelback.
2573	Manufacturer of a mold lubricant for soft rubber self-cutting molds.
2574	Manufacturer of Eldorado, a flooring of latex and cement.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
‡3	Carbon black and rubber manufacturing chemicals	Paris, France
*16	Nipples and combs	Habana, Cuba
†27	Tire-rebuilding equipment	Brussels, Belgium
†34	Druggists' sundries	London, England
†44	Rubber goods	Cairo, Egypt
†68	Druggists' sundries, hospital sheeting, corsets, dress shields, toys, and balloons	Alexandria, Egypt
*90	Balloons	Athens, Greece
*95	Rubber goods	Amsterdam, Netherlands
*100	Fountain pens	Toronto, Canada
*106	Cable wires	Alexandria, Egypt
*112	Bathing shoes, caps, water toys, and baby pants	Buenos Aires, Argentina
*121	Insulating tapes	Alexandria, Egypt
†153	Bathing caps	Prague, Czechoslovakia
*154	Rubber toys	Santiago, Chile
†158	Fountain pens, erasers, and novelties	Rotterdam, Netherlands
*164	Gas masks and apparatus	Belgrade, Yugoslavia
*169	Balloons, water bags, and baby pants	Santiago, Chile
†177	Rubberized fabrics	Prague, Czechoslovakia
‡181	Beach articles	Brussels, Belgium
†183	Gas masks	Hillegersberg, Netherlands
†190	Truck tires	Mexico City, Mexico
†197	Scrap rubber and sponge rubber waste	London, England
‡210	Office, school supplies, fountain pens	Brussels, Belgium
†213	Automobile accessories and parts	Brussels, Belgium
†8,790	Automobile accessories	Barnsley, England
‡8,792	Liquid and solid cement	Brussels, Belgium
‡8,815	Automobile accessories and novelties	Brussels, Belgium
*8,836	Druggists' and hospital rubber goods	Hillegersberg, Netherlands
‡8,842	Hospital sheeting and surgeons' gloves	London, England
†8,847	Sponge rubber hosiery savers	Stockholm, Sweden
*8,850	Rubber chemicals	Johannesburg, South Africa
*8,860	Fountain pens	Singapore, S. S.
†8,915	Toys, games, dolls, and roller skates	Sydney, Australia
*8,918	Balloons, balls, heels, bicycle inner tubes, toys, and liquid cement	Cairo, Egypt
*8,923	Rubber goods	Durres, Albania

*Agency. †Purchase. ‡Purchase and agency. §Purchase or agency.